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COMPETENCY CRITERIA FOR NURSE-MIDWIFERY: A METHODOLOGICAL STUDY

by

© PATRICIA HAYES

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled "Competency Criteria for Nurse-Midwifery: A Methodological Study" submitted by Patricia Hayes in partial fulfillment of the requirements for the degree of Master of Health Services Administration.

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Supervisor

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Date 7 November, 1973

DEDICATION

To my dear mother and my beloved father
whose love and faith have been a
constant source of strength.

ABSTRACT

In recent years new work groups have proliferated in the health sector leading to overlapping functions and responsibilities which have created difficulties in identifying and assigning competency levels. It is therefore important to delineate those abilities and skills which constitute a domain of tasks considered necessary for competent practice in specific work groups. Although officially non-existent in Canada, the role of the nurse-midwife is gaining increased attention. The purpose of this study was to describe a domain of tasks in terms of the knowledge and skills required for competent practice of nurse-midwifery.

The best way to describe competency was considered to be in terms of behavioural objectives (using criteria established by Mager and Ammons) which specialists could accept or reject. Acceptance was defined in terms of "necessary" knowledge-skills. In this study if an objective described a skill which all competent midwives must be able to perform, it was then deemed to be "necessary." Conversely, any person who could not perform any skill labelled as "necessary," was by definition incompetent.

The specialist panel was composed of ten nurse-midwives selected from countries with socio-economic standards and comparable health

delivery systems similar to Canada, and ten physicians practicing in Canada. The selection process was not randomized, which imposes limitations on the generalizability of the study. A further limitation is that one cannot be assured that each panel member did differentiate "necessary" from "desirable" on each objective.

Rigorous criteria were established for accepting an objective as "necessary" in that at least 75% of midwives and 75% of physicians had to regard the objective as "necessary." Of the 2437 objectives presented to the panel members, 2167 (89%) were considered "necessary." Agreement by such a widely disparate group of specialists tends to indicate that there is a core of knowledge-skill requirements for competent midwifery practice. It should be noted that the behavioural objectives which the panel members considered "necessary" are not a "sufficient" definition for midwifery practice.

By definition competency is the ability to demonstrate the behaviours described as "necessary" objectives. To illustrate how the attainment of some objectives could be measured, certain "necessary" behavioural objectives were incorporated into a simulation program (using the I.B.M. 1500 Computer Assisted Instruction (CAI) system). Computer simulation was selected as it appeared to provide the greatest flexibility in portraying real-life situations. The simulation program was pretested by a panel of "experts" (eight nurses and one doctor involved in planning a Canada-wide curriculum which incorporates a nurse-midwifery component) and by a group of students graduating from the University of Alberta's Northern Nurse Practitioner program. Each individual who pretested the program completed a questionnaire

which aimed at measuring the face validity of the testing tool. Although the experts indicated some agreement on the face validity of the simulation and the students thought the test was relevant, the findings should be viewed with caution in that the majority of panel members were not expert nurse-midwives (at present they are unavailable in Canada). Further research is required in this area.

It is suggested by the investigator that the objectives developed in this study could provide a tool which, combined with vital statistics indices and manpower projections, might be used to assess the cost-effectiveness of introducing nurse-midwives into the Canadian health system.

Use of the methodology developed in this study to delineate functions and responsibilities of nurse-midwives could help to clarify the identification and assignment of competency levels for other work groups in the health field.

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CHAPTER I

INTRODUCTION

Many work groups both professional and technical have overlapping functions and responsibilities which create difficulty in delineating and measuring performance proficiencies. During recent years new work groups in the health sector have proliferated (Rice, 1972). Problems have become apparent in the identification and assignment of competency levels, and in turn the amount of functions and responsibilities which can be assigned to each level of competency. Although it has been recommended that a task analysis be performed on each group rendering service (Light, 1969), little has been achieved in this direction. Furthermore, in the health care system competency and proficiency are heavily dependent on the standards set by the health profession for the delivery of safe care, and the expectations of the general public who receive the care. For this reason it is important to delineate those abilities and skills which constitute a domain of tasks considered necessary for competent practice within each work group. From a broad domain of tasks it is not only possible to establish the competency boundaries for a specified work group, but also to delineate the standards of quality. The work group selected in this study was nurse-midwives.

The Role of the Nurse-Midwife

The International Congress of Midwives has broadly defined a midwife as:

> . . . a person who, having been regularly admitted to a midwifery educational programme, duly recognized in the country in which it is located, has successfully completed the prescribed course of studies in midwifery and has acquired the requisite qualifications to be registered and/or legally licensed to practice midwifery [Minutes of the International Congress of Midwives, 1972, p. 1].

It is generally assumed that a nurse-midwife provides supervision and management of the mother during the ante-partum, intra-partum and post-partum phases of pregnancy, and evaluates the condition of, and provides necessary care for, the newborn. She should be able to identify potential and actual risk situations for mother and/or baby (i.e., conditions requiring potential care beyond her level of competency) and make appropriate referral to a physician. She should also be prepared to guide and counsel the mother and family in matters pertinent to maternity care and family planning.

The above tasks are generic to both midwives and physicians; but in those countries where midwifery is recognized, the tendency is for the physician to focus on the therapeutic role, confining his practice to care of the mother and/or baby who is at risk. In Holland midwives are considered equivalent to general practitioners (Kloosterman, 1968) whereas in Chile midwives are regarded as having a professional level between the family physician and the obstetrical specialist (Viel, 1968). Regardless of this variable professional status, midwives are recognized as independent practitioners in all countries except Canada and certain parts of the United States (Maternity Care in the World, 1966). In those countries where nursing training is a prior requirement for mid-

wifery training, the curriculum and midwifery roles are similar (Maternity Care in the World, 1966).

Due to the fact that Canada does not officially recognize the midwife, such practitioners are nonexistent except in northern nursing stations (Keith, 1971). Midwives who fill posts in these nursing stations are either recruited from other countries (Great Britain, Australia, New Zealand, etc.) or are Canadians who have been trained in other countries or trained as northern nurse practitioners.

Criteria of Midwifery Function

Although officially nonexistent in Canada, the role of midwives in the health delivery system is gaining increased attention (Munro, 1969; Hayes, 1971; Schmidt, 1972). Since physician and midwifery roles are closely tied, any possible future use of midwives requires a definition of those skills which would be embodied in the competent practice of their expected role. The purpose of this study was to describe a domain of midwifery tasks in terms of the skills required.

The best way to describe competency was considered to be in terms of behavioural objectives with which specialists could agree or disagree, using midwives and physicians as specialists. Agreement was in terms of necessary skills. The delineation of necessary skills was considered to be researchable, whereas the delineation of the sufficient skills of midwives was not. It is important to note the definition of "necessary" in terms of this study.

If an objective described a skill which all competent midwives must be able to perform, then it was considered to be necessary. Accordingly, any person who could not perform any skill regarded as necessary, was by definition incompetent.

The panel of validating specialists was composed of nurse-midwives (i.e., they had a complete nursing training as a prerequisite to their midwifery training) selected from countries with similar socio-economic standards, and comparable health delivery systems to Canada, and Canadian physicians. The physician panel members were confined to Canadian representation since their opinions were assumed to be more representative of the Canadian physician at large, than an international panel.

The objectives selected by this panel as being necessary skills for midwives were considered to be a start to evolving basic criteria of competent midwifery practice in Canada. To illustrate how the health care system could measure the attainment of some of the "necessary" objectives, certain validated behavioural objectives were incorporated into a simulation program (using the IBM 1500 Computer Assisted Instruction (CAI) system).

Limitations of This Study

Owing to the fact that the selection process for the expert panel members (both nurse-midwives and physicians) was not randomized, the panel's decisions cannot be generalized to all their colleagues or their countries. Even so, validation of the behavioural objectives

by such a widely disparate group gives some basis for stating that the domain of tasks agreed upon by this panel does describe skills which would be required in Canada for competent midwifery practice.

A further limitation is associated with the validation process in respect to the definition of "necessary skill." Although each panel member received explicit instructions as to this definition, one cannot be assured the experts actually did differentiate "necessary" from "desirable." Comments such as, "It would be nice to consider this necessary but it isn't really!" would lead one to suppose that the discrimination process did occur, but this may not hold true for each expert's opinion on each objective.

Summary

Inasmuch as there is a need to identify and assign competency levels, together with their associated functions and responsibilities for specified work groups, this study was undertaken to ascertain the necessary tasks for competent midwifery practice. Necessary tasks were defined in terms of behavioural objectives validated by a panel of subject matter specialists as skills which all competent nurse-midwives must have.

Limitations were placed on the generalizability of the findings of the study because of the non-random selection of the panel of specialists. Consideration was also given to the possibility that panel members did not adhere to the criteria established for "necessary" during the validation process.

The steps taken to validate the objectives and to develop the demonstration simulation program are described in Chapter III, while Chapter IV contains the analysis and interpretation of the specialists' responses. Before progressing to these topics, the reader is referred to a review of selected literature (Chapter II) which the writer used as references in developing the format of this study.

CHAPTER II

REVIEW OF SELECTED LITERATURE

Valid objectives describe the knowledge-skill components required for competency in the work situation and should form the bases for determining the functions and responsibilities of a work group. In the following review of selected literature the investigator has focused on the establishment of behavioural limits on a work group (nurse-midwives) for which criteria can be formulated, the development of criteria, and the use of criteria for evaluative purposes.

Limits of Criteria

The work group of midwives or nurse-midwives is a recognized independent profession in most countries of the world outside of Canada (Maternity Care in the World, 1966; Bayes, 1968; Hayes, 1971). Each country trains midwives to function in a manner acceptable to its own medical profession, patients, and manpower resources, with a consequence that midwives can be classified into four categories (Ainstein, 1968): (1) birth attendant, (2) midwife, (3) rural midwife, (4) nurse-midwife (this latter group is the only one to incorporate a full nursing training). It is the nurse-midwife who practices in most of the developed countries such as Great Britain, Ireland, Scandinavia, Australia and certain parts of the United States. In these countries the midwife is considered to be part of the maternity team, midway between the

nurse and doctor (Maternity Care in the World, 1966; Bayes, 1968; Lambertson, 1969; Forgotson and Forgotson, 1970; Lindencrona, 1971).

The basic knowledge and skill clusters concerning obstetrics are generic for both physicians and midwives (Kloosterman, 1968; Viel, 1968; Lambertsen, 1971), and diverge with increasing specialization, the midwife concentrating on supportive and sustaining measures, the obstetrician concentrating on therapeutic measures. It is the degree to which there is deviation from the normal life processes or deviation from a predictable physiological response that should regulate the supervision of care (Lambertsen, 1968; Maeck, 1971). Although Lang (1969) maintains that the obstetrician still carries final responsibility where there is any deviant response, Bayes (1968) states that ". . . all midwives should have a basic understanding of obstetric practice [p. 123]." It follows from Bayes' position that there is a definite need to clarify the precise role and necessary skills of a midwife if she is to be adequately trained and licensed to practice in Canada.

It has been suggested that midwives should be introduced into the Canadian health care service (Munro, 1969; Bruser, 1970; Hayes, 1971). Negative physician attitudes to this suggestion appear to be based upon (1) a threat to their professional status (Schmidt, 1972), (2) a fear that the family physician would have diminished responsibility for obstetrical care (McWhinney, 1972), and (3) the medico-legal and financial implications of a new category of worker (Korcok, 1972). Furthermore it has also been

maintained that ". . . physician service is better than midwives [Korcok, 1972, p. 2]"; nevertheless this is an assumption which has not been proven. The fact remains that opinions are changing, as is shown by the Society of Obstetricians and Gynaecologists of Canada proposal to open discussions with other professional associations to establish guidelines in the area of curriculum, training programs, and accreditation of maternity nurses (Schmidt, 1972).

In order to facilitate further discussion, this study focused on the definition of necessary skills for competent midwifery practice, in the manner previously described (cf.pp. 3, 4).

Development of Criteria

The introduction of a new work group (e.g., nurse-midwives) into the health care system could result in complex problems associated with altered manpower utilization. To help reduce the problems Light (1969) recommends that a task analysis be performed for each new work group. The degree of knowledge and judgement required and the kinds of skills needed for the accomplishment of a task are incorporated into the analysis.

The degree of knowledge is a difficult analysis to make because it implies both a measurement factor (degree) and a concept (knowledge). Taxonomic hierarchies were initially constructed by Bloom, et al. (1956) and Krathwohl, et al. (1964) for the cognitive and affective domains and were further developed (Bloom, et al., 1971) and expanded, to include the perceptual and psychomotor domains by Baldwin (1971). But Nettler (1971) argues against such

specificity stating that "To have knowledge is not the same as to have information, or to be familiar with, or to be aware of, or to exhibit a competence [p. 18]." In fact, Gagne and Paradise (1961) propose that knowledge is an inferred capability resulting from the performance of a class of measurable tasks and Ebel (1965) extends this definition beyond specific measurable tasks into areas or problem solving, decision making, explanation and prediction. Furthermore, if one accepts the premise that knowledge is an inferred capability associated with the performance of a task, then it is the integration and utilization of accumulated facts and competencies which are the components of knowledge. Therefore, a task can only be regarded as complete if the relevant facts and competencies are present, and proficiency in a task demonstrated by an automatic response (Baldwin, 1971).

The literature indicates how one can develop a bank of tasks for a given profession through the development of objectives which describe the behaviour expected in the performance of these tasks. Statements of the objectives must be worded in a reasonably concise manner, as accurately and unambiguously as the precision of knowledge allows (i.e., uniform meaning) and at an appropriate level of generalizability (Ebel, 1965; Eggleston and Ken, 1969; Thorndike and Hagen, 1969). Mager (1962) recommends three elements which should be incorporated into each objective: (1) specific observable behaviour; (2) important conditions under which the behaviour is expected to take place; (3) specific criteria for acceptable performance. Atkins (1969) and Ammons (1969) argue that certain desired outcomes (e.g., problem solving, decision making) cannot be described

in behavioural terms. Accordingly, Ammons adds a fourth criterion to Mager's list, one designating non-observable behaviour which ". . . can be inferred according to definitions agreed upon by those involved [p. 911]."

If one accepts the positions of Mager, Atkins and Ammons, objectives can be developed for task criteria which describe both observable and non-observable behaviour. In areas of specialization these objectives must be agreed upon by experts in the field, and considered to be necessary areas of knowledge: (1) they must be acceptable as established truth by a preponderance of experts in the field; (2) they must be regarded as the proposition most worthy of knowing and remembering by a majority of experts in the field; (3) they must express principles and ideas not generally known by those who have not studied in the field (Ebel, 1965, p. 44).

The above three criteria of Ebel are the basic steps in the establishment of content validity -- that is ". . . what the best and most expert judgement consider to be important knowledge and skills [Thorndike and Hagen, 1971, p. 165]." Content validity is of supreme importance in achievement and proficiency testing (Dubois, 1954; Technical Recommendations of the American Psychology Association, 1954; Anastasi, 1961; Ebel, 1965; Gronlund, 1970; Thorndike and Hagen, 1971; Hazlett, 1972), therefore Bloom and Hastings suggest that ". . . if you get 75 percent agreement or better [among experts] you can feel comfortable about content validity [p. 76]."

Therefore, a domain of tasks for a specialty field can be

formulated by (1) developing behavioural and nonbehavioural objectives, and (2) having content experts decide upon their relevancy and utility to their particular field of specialization. Subsequently the validated objectives would be the criteria for measuring acceptable performance in that specialization.

Use of Criteria for Evaluation

Traditional testing methods adapted from the areas of general education may not be adequate or effective in measuring behaviours which have been described according to Mager's criteria (cf. p. 10). Entrance to health professional schools is generally based on norm-referenced tests with admission limited to those in the upper percentile ranks. Consequently there is a certain degree of homogeneity in the intellectual and behavioural capabilities of selected students (Garvin, 1971). However, the major factor in norm-referenced examinations is the need for variability within the test in order to display a relative comparison or spread among individuals (Glaser, 1963; Popham and Husek, 1969). It has been argued that in a fairly homogenous group a spread is artificially forced, resulting in ranks that have little to do with students' relative knowledge levels (Goldstein, 1958). Glaser (1971) agrees with Goldstein's argument:

> Test construction practices often lead to tests comprised of tasks that tend to distort interpretations about the capability of the examinee with respect to a clearly defined domain of performance standards [p. 44].

It has therefore been suggested:

> If we must select individuals to perform a given task at some fixed standard of competence, no matter how many or how few qualify, the criterion-related measurement is indicated [Garvin, 1971, p. 61].

Moreover, evaluation of terminal behaviour in the health professions is also associated with certification to act as a practitioner. Fuerst (1958) proposed that traditional certification practices could be improved by reporting achievement levels ". . . which indicate demonstrated levels of competency rather than the relative standing in the group [p. 13]." Garvin (1971) also endorsed this technique for making informed decisions when certain tasks must be performed at a specifically high level.

> If public safety, economic responsibility, or other ethical considerations demand that certain tasks be performed only by those 'qualified' for them by formal instruction, the criterion-referenced measurement of the outcome of such instruction is closely indicated. The criterion here is the licensing standards of the profession involved [p. 62].

A criterion-related measuring instrument concentrates on the characteristics and properties of present performance in a particular specialization (Glaser, 1963, 1971; Simon, 1969). It is appropriate therefore for the content of a test to be based upon behavioural objectives judged as being congruent with task-level requirements by subject matter specialists (cf. p. 10). Clearly, then, if the focus is on whether or not an individual possesses a particular competence, no constraints are placed upon how many possess the skill.

Although criteria referenced tests are not concerned with

the statistical problems of group homogeneity, such tests do not necessarily solve the problem of transfer to real life situations. Ideally, test items should be constructed in such a manner that they elicit the behaviour described in the validated objective (Dahl, 1971; Popham, 1971; Hazlett, 1972). That is to say, it is not sufficient that criterion-referenced tests be based solely on validated objectives; rather, one must also be able to assume that in order to answer the test item correctly the student must call on the same skills specified in the objectives. This latter criterion may not be well achieved by pencil and paper tests (Charvat, 1968).

A possible solution to the problem of evaluating meaningful criteria which relate to clinical competence is to utilize simulation. Gagne (1962) delineated the value of simulation: (1) it attempts to represent a real situation, (2) it provides the user with certain controls over the operational situation, (3) it is reliable upon repeated samples because the uncontrolled variables of real life have been reduced, (4) it can effectively carry out the practice of essential motor skills, procedures, and decisions that put "knowledge" into practical action.

The development of a simulation program which is in accord with specified behavioural objectives would appear to resolve some of the problems attendant to the evaluation of competency in the real life situation.

Summary

This review of selected literature has included the work group of midwives, their status in Canada and the manner by which a domain of tasks associated with competent practice could be established. The development of criteria from the knowledge-skill components of tasks was described in terms of a modification of Mager's standards for compiling behavioural objectives. The use of behavioural objectives as a basis for evaluation was discussed in terms of criterion-referenced tests and simulation was suggested as a method of eliciting meaningful achievement levels delineated in the objectives.

CHAPTER III

DESIGN OF THE STUDY

Following a selected review of the literature (Chapter II), the assumption was made that the development of behavioural objectives was a concrete method of establishing a domain of tasks for a specific work group (cf. p. 10). Acceptability of the objectives was a task for subject matter experts (cf. p. 11) with the content validation criterion of seventy-five percent agreement being recommended (cf. p. 11). Furthermore, it was presumed that validated objectives could be used as a basis for the development of criterion-referenced tests, simulation being considered the preferred testing method (cf. p. 14).

The foci of the following chapter are depicted in Figure 1: (1) the development and validation of the objectives, and (2) the transfer of validated objectives to a criterion-referenced test (cf. p. 13).

Development of the Objectives

A nurse-midwife is part of the obstetrical team. Her education presumably encompasses both nursing and basic obstetrical skills. Even though there are indications she can practice independently when patients exhibit no deviation from the normal, the midwife presumably should practice in liaison with a physician in order to expedite the referral of abnormalities to that physician. Therefore, tasks related to the function of nurse-midwifery not only encompass both nursing and

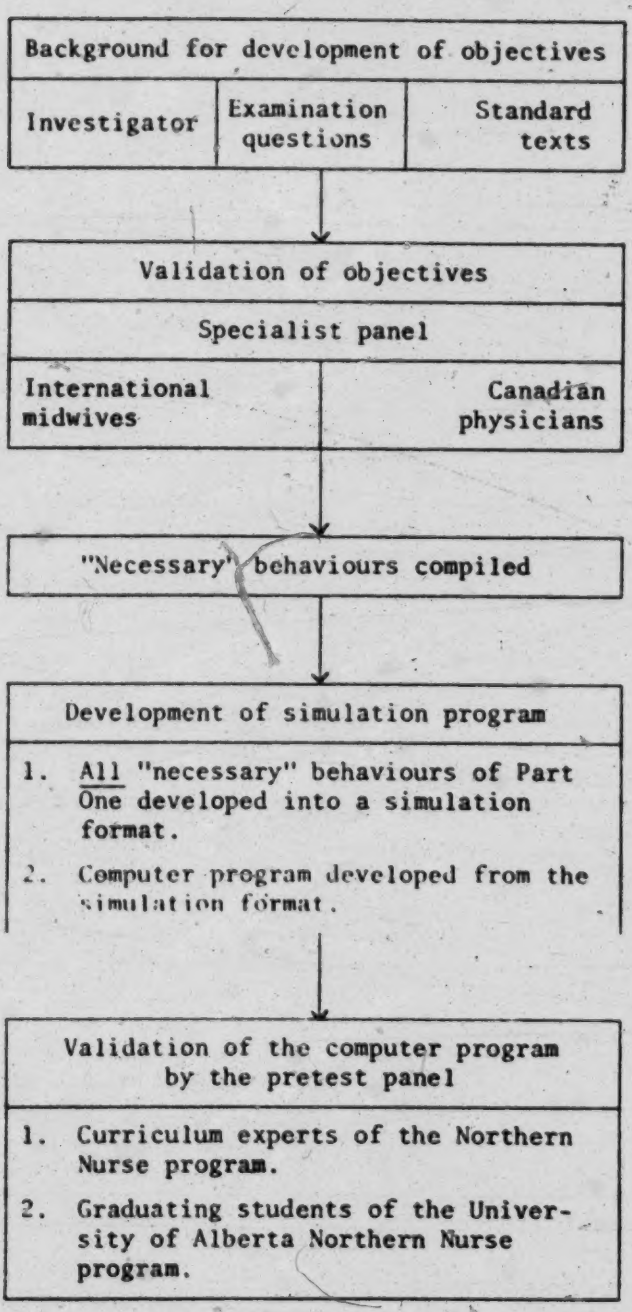
Background for development of objectives
Investigator
Examination questions
Standard texts
Validation of objectives
Specialist panel
International midwives
Canadian physicians
"Necessary" behaviours compiled
Development of simulation program
1. All "necessary" behaviours of Part One developed into a simulation format.
2. Computer program developed from the simulation format.
Validation of the computer program by the pretest panel
1. Curriculum experts of the Northern Nurse program.
2. Graduating students of the University of Alberta Northern Nurse program.

Figure 1.

DEVELOPMENT AND USE OF MIDWIFERY OBJECTIVES

basic obstetrical skills, but also the ability to recognize deviations from the normal during the maternity cycle.

To develop midwifery objectives this investigator (1) drew upon her own experience (R.N., S.C.M., B.N.; three years as a practitioner, 10 years as a clinical instructor), (2) investigated published essay examinations of the Central Midwives Board (England and Wales) (Myles, 1972), and (3) referred to standard midwifery and obstetrical texts (e.g., Eastman, 1966, Myles, 1972).

The description of tasks for the midwife was divided into five parts: (1) initial prenatal visit at the end of the first trimester; (2) prenatal care; (3) labor and delivery; (4) newborn and infant care; (5) maternal puerperal care. Behavioural objectives were developed for each of these five periods according to Mager's (1962) and Ammons' (1969) criteria (cf. p.10). For example, the nurse-midwife would be expected to estimate the weeks of gestation (specific observable behaviour) within a two week period (specific criteria for acceptable performance) by locating the level of the uterine fundus in the abdominal cavity (conditions under which the behaviour would occur). It is important to note that not every objective specified the condition under which the behaviour would occur; rather, such conditions were tacitly described in the titles of various subheadings. Even though each objective was confined to a specific behaviour, many objectives were inter-related; for example, (1) during the initial prenatal visit the nurse-midwife interviews the

mother and asks the mother the date of the first day of the last menstrual period, and (2) with this information the nurse-midwife must use Nagele's formula to calculate the due date of delivery.

Objectives not only described observable behaviour; non-observable behaviour was also included in the objectives under the designate "to know." In this study knowledge was considered to be a body of facts which were likely meaningful and useful in a given situation because they were a proven truth. This knowledge was considered so germane to the field of midwifery that the achievement of this objective would be demonstrated by a non-cued response. In other words, it was assured that the midwife should have such knowledge at her 'fingertips' and could manifest a spontaneous response. The following example will illustrate objectives that describe the non-observable behaviour "to know." Recall that the midwife was to calculate the due date of delivery using Nagele's formula (cf. p. 18); in addition to this the midwife is expected "to know" that the due date is an estimate and could be up to two weeks incorrect. Therefore, the knowledge objective incorporated factors which could modify the observable behaviours and may be the crucial elements of problem-solving and decision-making.

In order to facilitate the validation process by the panel of experts, content coherent objectives were arranged to follow from one another sequentially. This format facilitated the identification of

invalid objectives without necessarily invalidating a total content coherent area. The following example will illustrate this latter point.

1. Ask the mother if
   a. her membranes have ruptured . . . . . .
   b. she is having contractions . . . . . .
   c. she has any "show" . . . . . .
      i. Know that membranes can rupture prematurely and prior to labor . . . . . .
         a) If the mother states that her membranes have ruptured ask
            (i) the time they ruptured . . . . . .
            (ii) the amount and color of the discharged fluid . . . . . .
         b) Calculate the length of time the membranes have been ruptured . . . . . .

Thus an expert could classify 1.c.i.a)(i) as necessary and 1.c.i.a)(ii) as not necessary even though these two objectives were associated in content. This format also facilitated the identification of inconsistencies in the experts' responses; for example, if a content expert considered 1.a not necessary but classified 1.c.i.a) as necessary, then one could assume the validator was not rigorously exercising his judgement.

Validity is the criterion for not only judging a test (Ebel, 1961) but also the objectives upon which the test is based (Ammons, 1969). Content validity is particularly associated with the <u>type</u> of behaviour involved (Technical Recommendations for Psychological Tests and Diagnostic Techniques, 1954). Since content validation of objectives is a task for content specialists (cf. p. 11), a panel representing expert judgement was formed. The investigator decided that the

midwives on this panel should be an international group, rather than exclusively Canadian because of the severe limitations placed on the practice of midwifery in Canada. The criteria for national selection, other than in the case of Canada, were (1) the practice of normal obstetrics was performed by "nurse-midwives" (cf. p. 7), (2) the practice of nurse-midwifery was an acceptable part of the delivery of health care in that country, and (3) the socio-economic climate of the health care system was reasonably comparable to Canada. At the International Congress of Midwives held in Washington, D.C. in the fall of 1972, a non-random selection of midwives was made from among those in attendance; selection was based upon the willingness of the midwives (from countries meeting national selection criteria) to participate. The countries selected and the positions and qualifications of the nurse-midwife panelists are depicted in Table 1. Each panel member was approached personally by the investigator and the criteria for validation explained (cf. p. 3). One section of the objectives was presented at this time and the remaining objectives mailed at a subsequent date. Two midwives from Canada were included on this panel, both involved with the preparation of nurse-midwives for the Northern Health Services.

The physicians on the panel had not necessarily been educated in Canada but at the time of validation were practicing in Edmonton, Canada. Some had worked with midwives, while others were only familiar with the practice of midwifery as a theoretical concept. There

Table 1

MIDWIFERY PANEL: COUNTRY, POSITION AND QUALIFICATIONS

Country	Position	Qualifications
1. England	Assistant Matron Tutor	S.R.N., S.C.M., M.T.D., R.M.P.A. Cert.
2. England	Senior Nursing Officer; Midwifery	S.R.N., S.C.M., M.T.D.
3. Canada	Nursing Officer; Federal Government	R.N., B.N., M.S., C.N.M.
4. Canada	Assistant Professor, Northern Nurse Program	R.N., B.S., M.S., C.N.M.
5. Australia	Ward Sister	R.N., S.C.M.
6. Ireland	Midwife Teacher	S.R.N., S.C.M., M.T.D.
7. New Zealand	Ward Sister; Neonatal Tutor	S.R.N., S.C.M.
8. Norway	Ward Sister	R.N., S.C.M.
9. U.S.A.	Instructor of Nurse-Midwifery	R.N., B.S., M.S., C.N.M.
10. U.S.A.	Supervisor of Nurse-Midwifery	R.N., B.S., M.S., C.N.M.

was no random selection of physicians; participation was based solely on their willingness to cooperate and that their practice included giving care to the parturient woman (general practitioners and obstetricians) and the newborn (general practitioners, obstetricians and pediatricians). The positions and qualifications of each physician are given in Table 2.

It is important to note again that the criterion which the panelists were to use in validating each objective was that they had to consider the objective necessary for competent midwifery practice (cf. p. 3, 4). Although most, if not all, of the objectives could be considered "desirable" for midwifery practice it was emphasized that if all midwives did not have to have the skill or knowledge, then that objective could not be considered "necessary" (cf. p. 4). In order to be researchable, behavioural objectives developed by the investigator for validation could not encompass every necessary behaviour; each panel member was assured that the bank of objectives was not sufficient.

At least 75% agreement amongst panel members was chosen as an acceptable level for content validation (Bloom and Hastings, 1971). Only those objectives which attained this criterion level for both midwives and doctors would be retained, although objectives which met the criteria in one group and not the other would highlight areas of controversy.

Table 2

PHYSICIANS PANEL: POSITION AND QUALIFICATIONS

Position	Qualifications
1. Professor Emeritus, Obstetrics and Gynaecology	B.A., M.D., F.R.C.S.(C), F.R.C.O.G., F.A.C.S., F.A.C.O.G.
2. Associate Professor, Obstetrics and Gynaecology	B.Sc., M.S., F.A.C.O.G., F.R.C.S.(C)
3. Clinical Instructor	M.D., F.R.C.S.(C)
4. Associate Clinical Professor, Obstetrics and Gynaecology	M.D., F.R.C.S.(C)
5. Assistant Clinical Professor, Obstetrics and Gynaecology	M.D., M.R.C.O.G., F.R.C.S.(C)
6. Family Clinic Staff	M.C.F.P., M.B., C.L.B., D.R.C.O.G., C.C.F.P.
7. Clinical Instructor	B.A.O., F.R.C.S.(C)
8. Associate Professor, Community Medicine	M.D., C.C.F.P.
9. Assistant Professor, Pediatrics, Obstetrics and Gynaecology	B.Sc., M.D., Ph.D.
10. Assistant Professor, Pediatrics	M.D., F.R.C.P.(C)

Development of a Criterion-Referenced Test

A criterion-referenced test (cf. p. 13) was developed from the validated objectives of the first part of the Objectives for Midwifery Practice (cf. pp. 53-55) in the form of a simulation program. Although various methods of simulation have been described (Rimoldi, 1963; Williamson, 1965; Charvat, 1968; Rossall, 1971), computer simulation appeared to provide the greatest flexibility in portraying real-life situations. The computer used (IBM 1500 Instructional System) has the following facilities: (1) a television screen upon which messages can be displayed and which is sensitive to light pen interaction; (2) a screen for displaying slides; (3) a typewriter keyboard by which messages can be delivered to the computer; (4) a sound track from which audio messages can be played.

The simulation program included all the validated objectives and was constructed in such a way as: (1) to allow for the collection of information in a manner similar to an initial midwife-patient encounter; (2) to ensure that decisions pertaining to information about the patient were sequential and interdependent; (3) to allow for a variety of pathways to obtain information and also a variety of responses (depending upon the subjects approach to the situation); (4) to assess those behavioural objectives which began with the phrase "to know" by presenting questions which required a non-multiple choice response; (5) to make each decision binding on the midwife in the scoring scheme.

Included in the program is a ten minute introduction designed to (1) familiarize the subject with the response modes incorporated into the program; (2) diminish the novelty effect through practice with the IBM 1500 terminals; (3) delineate for the subject the meaning of specific terms used in this computer simulation, namely "essential," "of interest," "of no value," "high risk," and "low risk." These terms are used at specified points in the program to categorize information that has been obtained by the midwife. "Essential" means that adequate care cannot be given without this information. "Of interest" means the information aids in the giving of care but is not vital. "Of no value" means the information has no effect on care. "High risk" means there is potential danger to mother and/or infant. "Low risk" means that on the basis of present information the chances of a dangerous situation are minimal.

After the ten minute introduction, an explanation of the obstetrical situation to be considered is presented following which the midwife taking the simulation is brought to a major decision point. Following directly from the sub-headings of the validated objectives, a competent midwife would choose the most appropriate and logical order of obtaining information from among the following choices: (1) obtain a history from the patient; (2) perform examination on the patient; (3) perform laboratory tests; (4) teach the patient; (5) query the physician; (6) compile the pregnancy history. The subject taking this simulation is branched by the program to further decision

areas and related questions from each of the six choices listed above, and at the end of each section (with the exception of the sixth) is able to return to this main decision point.

An example of the process by which information can be gathered in this simulation is illustrated in Figure 2. From the main decision point (Figure 2, step 1) a competent midwife would first elect to obtain a history from the patient (step 2), and then obtain the obstetrical history (step 3) from which the menstrual history would be selected. Finally, the patient would be asked the date of the first day of the last menstrual period (step 5). Up to this point the route taken would be chosen by the midwife. Steps 6 and 7 in Figure 2 are questions generated by the computer. In effect, however, steps 4, 5, 6, and 7 incorporate a section of validated behavioural objectives (cf. Appendix A, p. 54). At the conclusion of step 7 the midwife would be returned to step 4 by the computer. At this decision point alternate routes can be chosen or, if none are desired, the midwife would be returned to step 3. This same process would be repeated at each decision point until the midwife returned to the main decision point (step 1). The amount and type of information accumulated by the midwife is therefore controlled through the choices made at each decision point: since the choices, pathways, and answers required in this simulation reflect behaviour required by a competent midwife, this simulation was considered to be a legitimate measure of midwifery practice in the first trimester.

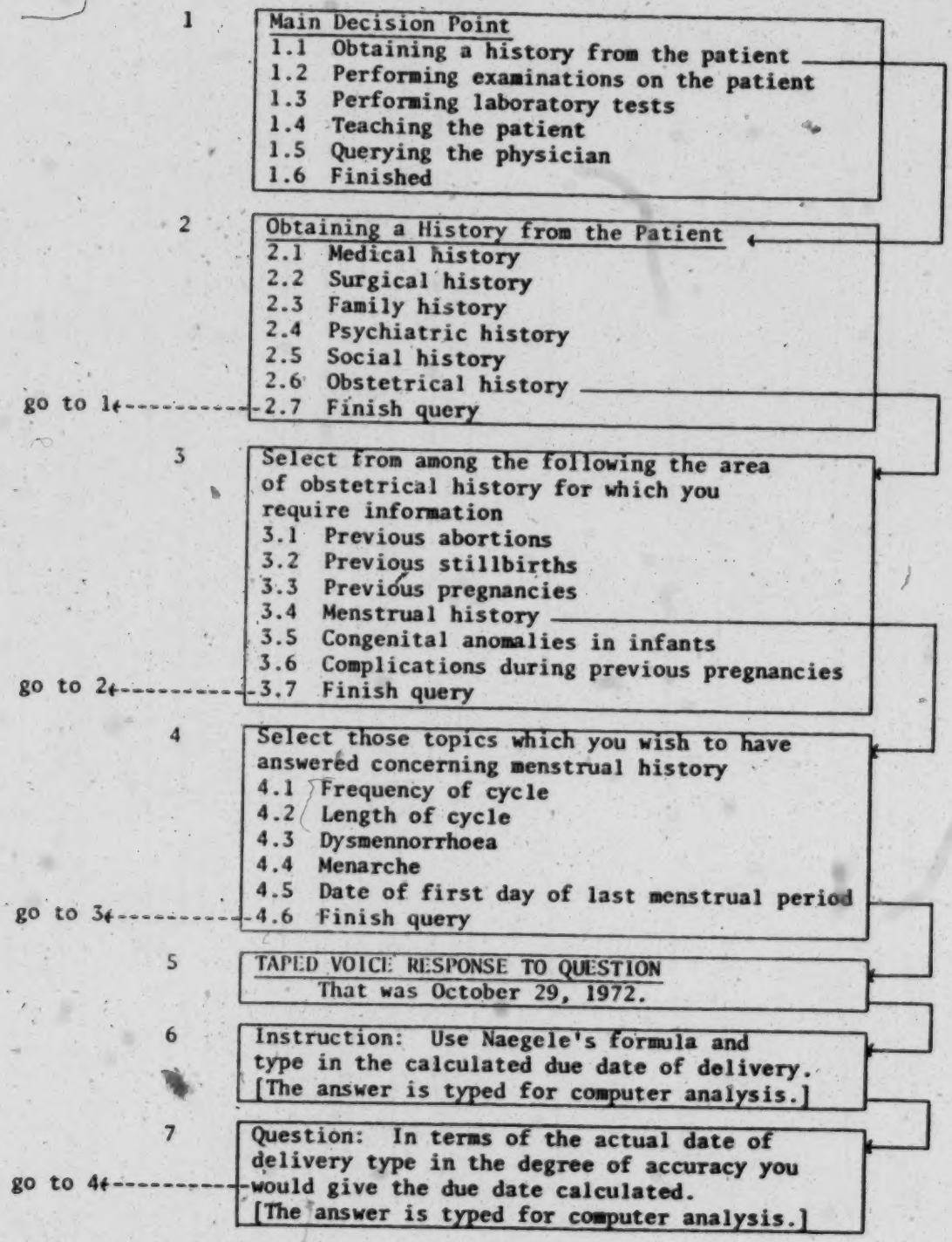
1
Main Decision Point
1.1 Obtaining a history from the patient
1.2 Performing examinations on the patient
1.3 Performing laboratory tests
1.4 Teaching the patient
1.5 Querying the physician
1.6 Finished
2
Obtaining a History from the Patient
2.1 Medical history
2.2 Surgical history
2.3 Family history
2.4 Psychiatric history
2.5 Social history
2.6 Obstetrical history
go to 1
2.7 Finish query
3
Select from among the following the area of obstetrical history for which you require information
3.1 Previous abortions
3.2 Previous stillbirths
3.3 Previous pregnancies
3.4 Menstrual history
3.5 Congenital anomalies in infants
3.6 Complications during previous pregnancies
go to 2
3.7 Finish query
4
Select those topics which you wish to have answered concerning menstrual history
4.1 Frequency of cycle
4.2 Length of cycle
4.3 Dysmennorrhoea
4.4 Menarche
4.5 Date of first day of last menstrual period
go to 3
4.6 Finish query
5
TAPED VOICE RESPONSE TO QUESTION
That was October 29, 1972.
6
Instruction: Use Naegele's formula and type in the calculated due date of delivery. [The answer is typed for computer analysis.]
7
Question: In terms of the actual date of delivery type in the degree of accuracy you would give the due date calculated. [The answer is typed for computer analysis.]
go to 4

Figure 2

ILLUSTRATION OF THE SIMULATION ROUTE PROGRAMMED FOR ONE VALIDATED BEHAVIOURAL OBJECTIVE

In order to estimate whether subjects are able to identify important information the midwife examinees are also asked to decide if certain data are essential, of interest, or of no value (cf. p. 26). If the midwife believes the datum obtained is essential or of interest she may be asked to classify the patient into a high or low risk category (cf. p. 26) and then decide the course of action to be taken. It was assumed such decisions would indicate whether or not the midwife is able to recognize situations which are beyond her level of competency and make an appropriate referral. An automated scoring system is included in the program. Marks are given for correct responses and are subtracted when the midwife is unable to recognize essential information, a high risk situation, and/or takes inappropriate action (presumably demonstrating that "necessary" behaviours are not known).

Establishment of Face Validity

The simulation program was pretested by eight nurses and one doctor who were involved in the Canada-wide curriculum planning for the Northern Nurse Practitioner Program which incorporates a nurse-midwifery component. These personnel were from the Universities of Alberta, Manitoba, Saskatchewan, Toronto, Western Ontario, McGill, and Sherbrooke. Following the simulation program this panel completed a modified questionnaire used by Hazlett (1972) and Steele (1968, 1970) in order to estimate the face validity of this simulation for measuring the necessary objectives for nurse-midwifery practice. Parallel item format was used to establish

reliability and validity estimates. In addition opinions were solicited from eight students who were in the final weeks of the University of Alberta Northern Nurse Practitioner program. They each took the simulation program and completed the questionnaire described above.

Summary

The first section of this chapter dealt with (1) the development of behavioural objectives in the format recommended by Mager (1962) and Ammons (1969); (2) the selection of the panel of experts; and (3) the criterion used by the panel to establish content validity associated with necessary tasks of nurse-midwifery. In the second section, the development of a criterion-referenced computer simulation test was discussed, in particular the method by which the validated behavioural objectives were integrated into the simulation program in order for it to be used as an evaluative tool for measuring the attainment of objectives. Finally, the process of estimating the face validity of the testing tool was explained.

CHAPTER 4

RESULTS, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

For this study a criterion of "necessary" tasks for competent midwifery practice was used by a panel of experts for accepting or rejecting the behavioural objectives; if 75% or more of the midwives and if 75% or more of the doctors accepted any objective, it was then classified as a validated (that is, necessary) objective for midwifery. A criterion referenced test (cf. p. 13) was also developed from Part One (cf. pp. 53-55, Appendix A) of the validated objectives; subjects who took this test filled in a questionnaire which attempted to measure the face validity of this test. The results of all of the above processes will be presented in this chapter under the following headings: (1) validation of the objectives; (2) objectives considered necessary; (3) objectives considered unnecessary; (4) validation of the criterion referenced test; (5) conclusions and recommendations arising from the study.

Validation of the Objectives

The behavioural objectives compiled according to Mager's (1962) and Ammons' (1969) criteria were distributed in five parts. The return rates of each panel member are shown in Table 3 (midwives) and Table 4 (physicians). In general, the midwives were more cooperative than the physicians in returning the completed parts. It should be noted that any section which was returned was completed by the

Table 3

RETURN OF VALIDATED OBJECTIVES
BY MIDWIVES

Countries	PARTS				
	I	II	III	IV	V
1. England	x	x	x	x	x
2. England	x	x	x	x	x
3. Canada	x	x	x	x	x
4. Canada	x				
5. Australia	x	x	x	x	x
6. Ireland	x	x	x	x	x
7. New Zealand	x	x	x	x	x
8. Norway	x	x	x	x	x
9. United States	x	x	x	x	x
10. United States	x				

Table 4

RETURN OF VALIDATED OBJECTIVES
BY PHYSICIANS

Physicians*	PARTS				
	I	II	III	IV	V
1	x	x	x	x	x
2	x	x	x	x	x
3	x	x	x		x
4	x				
5	x				
6	x	x			
7	x	x	x		
8	x				
9				x	
10				x	

* Numbers correspond to the list of physicians in Table 2.

particular individual who did the validating.

Recall that the criterion of acceptability for content validation was that at least 75% of the midwives and 75% of the doctors had to regard the objective as "necessary" before it could be classified as a midwifery objective. Since only three physicians completed Part Five, the requirement for validated objectives in that section was actually at least 75% of midwives and 100% of physicians.

All objectives that were validated by the total panel (midwives and physicians) are cited in Appendix A; i.e., each of these objectives meets the above criterion of "necessary." If the panel of experts (1) was representative of both populations of midwives and doctors, and (2) did not deviate from the definition of "necessary" established for this study (cf. p. 4), one could assume that an individual who does not possess all the behaviours specified in Appendix A is not a competent midwife. Since this study did not provide controls on either the representativeness of the panel or the panel's tendency to deviate from the definition of "necessary," the objectives laid out in Appendix A must be viewed cautiously. Furthermore, the reader should note that some panel members suggested the inclusion of more objectives; accordingly the objectives in Appendix A cannot be used as a "sufficient" definition for competent midwifery practice. However, if one considers (1) the purpose of this study was to develop a researchable number of behavioural objectives, and (2) that knowledge-skill elements of any profession are not static, and (3) that standards of competent practice change over time, then a larger bank of behavioural

objectives could be compiled through a similar validation process with a regular pattern of review carried out to incorporate changing standards.

Out of the 2437 objectives which were originally written by the investigator, (1) 2197 objectives (89%) were regarded as necessary by both midwives and physicians, (2) 28 objectives (1%) were regarded as not necessary by both midwives and physicians, (3) 146 objectives (6%) were regarded as necessary by midwives and unnecessary by physicians, and (4) 96 objectives (4%) were regarded as necessary by physicians and unnecessary by midwives (cf. Table 5). An examination of each of the five parts (cf. Table 5) gives some indication where the greatest areas of disagreement were found. Part One (Initial Ante-natal Interview) was reviewed by the largest number of physicians (7); only 75% of the objectives were regarded as "necessary" by both midwives and physicians. In all other parts no less than 85.7% (and as many as 98%) of the objectives originally written by this investigator, were classified as "necessary" by both the physicians and midwives. It may well be that if all physicians had returned sections two to five, fewer objectives would have been classified as "necessary" in this study. The reader should also note that Part Three (Labor and Delivery) shows the least amount of disagreement between the midwives and physicians.

The findings do indicate a considerable amount of agreement between both professional groups as to the knowledge-skill tasks

Table 5

ORIGINAL OBJECTIVES REGARDED AS "NECESSARY" AND "NOT NECESSARY" BY MIDWIVES AND PHYSICIANS

Parts One - Five (Combined)

		Physicians: Necessary	Physicians: Not Necessary	
Midwives: Not Necessary		96 (4%)	28 (1%)	124 (5%)
Midwives: Necessary		2167 (89%)	146 (6%)	2313 (95%)
		2263 (93%)	174 (7%)	2437 (100%)

Part One

		Physicians: Necessary	Physicians: Not Necessary	
Midwives: Not Necessary		8 (2%)	10 (3%)	18 (5%)
Midwives: Necessary		249 (75%)	66 (20%)	315 (95%)
		257 (77%)	76 (23%)	333 (100%)

Part Two

		Physicians: Necessary	Physicians: Not Necessary	
Midwives: Not Necessary		53 (7.8%)	5 (0.7%)	58 (8.5%)
Midwives: Necessary		590 (85.7%)	40 (5.8%)	630 (91.5%)
		643 (93.5%)	45 (6.5%)	688 (100%)

. . . . Continued

Table 5 -- Continued

Part Three

		Physicians: Necessary	Physicians: Not Necessary	
Midwives	Not Necessary	10 (1.5%)	0	10 (1.5%)
	Necessary	640 (98%)	3 (0.5%)	643 (98.5%)
		650 (99.5%)	3 (0.5%)	653 (100%)

Part Four

		Physicians: Necessary	Physicians: Not Necessary	
Midwives	Not Necessary	9 (2.7%)	1 (0.3%)	10 (3%)
	Necessary	310 (93.6%)	11 (3.3%)	321 (96.9%)
		319 (96.3%)	12 (3.6%)	331 (100%)

Part Five

		Physicians: Necessary	Physicians: Not Necessary	
Midwives	Not Necessary	16 (3.7%)	12 (2.8%)	28 (6.5%)
	Necessary	378 (87.5%)	26 (6%)	404 (93.5%)
		394 (91.2%)	38 (8.8%)	432 (100%)

"necessary" for competent midwifery practice. Some panel members may have used a dual criterion in considering the objectives: (1) the "necessary" criterion, and (2) the content accuracy of the objectives. Even so, it is presumed that if the content was incorrect then the panel member would in no way consider the task "necessary."

Due to international variations in midwifery practice, one might assume that the requirement of 75% agreement among the midwives used in this study would produce a larger number of "unnecessary" objectives than a national panel. However, the considerable agreement among the international body of midwives, (as well as between these midwives and Canadian physicians) tends to indicate that there is a core of knowledge-skill requirements for competent midwifery practice. Nevertheless the reader is reminded that the criteria for a country's selection was its similarity to Canada's social, economic, and health conditions (cf. p. 21).

Objectives Considered Necessary

A large proportion of the 2167 objectives in Appendix A are in the "to know" category. Most of the "to know" objectives are in content coher[illegible] sections (cf. p.19) which include observable behaviours of a competent nurse-midwife. It may be that there is an interrelationship between the "to know" objectives which could be associated with problem solving and decision making. For example, (1) knowing that membranes can rupture at different times during pregnancy, (2) knowing that the color of the amniotic fluid draining through the ruptured membranes can indicate the condition of the fetus, and (3) knowing

that the fetal heart rate can confirm the condition of the fetus, allows the nurse-midwife to set priorities on the tasks associated with assessment of a mother presenting with ruptured membranes. Furthermore, based upon the assessment findings and knowledge concerning prematurity, normal labor, and fetal distress, the nurse-midwife can then also provide the correct ongoing care and supervision of the mother. The fact that panel members usually accepted all coherent "to know" and "to perform" objectives may be one indication that the experts saw the need for the integration of knowledge and skills illustrated above.

Objectives Considered Unnecessary

The number of objectives which were originally written by the investigator but which were considered "unnecessary" by the panel, were 270 (11%). It should be noted that most "unnecessary" objectives were segments of a content coherent area. (For example, in a content coherent area comprised of twenty-five objectives, one objective was classified as "unnecessary.") These "unnecessary" objectives have not been included in an Appendix because they become meaningless when removed from context. However, a general discussion of the characteristics of these objectives follows.

Unnecessary: Midwives and Physicians

The 28 objectives which both physicians and midwives regarded as "unnecessary" fell mainly under the subheadings of "examinations" and "management of care." Due to this relatively small number of objectives considered "unnecessary" no conclusions can be drawn.

Unnecessary: Midwives Only

Some of the 96 objectives which midwives regarded as "unnecessary" but the physicians regarded as "necessary" describe "to know" behaviours. Since most "to know" behaviours written by this investigator were considered "necessary," (cf. p. 37) it would appear that the midwives set some limits upon the amount of "finger-tip" knowledge required for competent practice. Of the remaining objectives that the midwives considered "unnecessary" but physicians thought were "necessary", some describe observable behaviours associated with patient teaching. Since teaching has a cultural bias it is conceivable that there would be variations amongst countries in the area of patient teaching. Accordingly, an international panel would have difficulty in agreeing on the methods used to teach in spite of the fact that agreement could be reached concerning the "necessary" knowledge required to function as a competent patient teacher.

Some objectives considered "unnecessary" by midwives but "necessary" by physicians were in the area of family planning. One midwife commented that it was necessary for a midwife to know about family planning but teaching it would involve many other factors (e.g., cultural, legal, perception of the physician's role, etc.). Another midwife considered the total section unnecessary and made the comment that she did not think it was part of a midwife's function to teach family planning. As this judge was a Roman Catholic sister, there may have been a religious bias involved. It is important to note that only midwives considered these behaviours "unnecessary" while physicians apparently felt that the teaching of family planning

was a "necessary" task for a midwife. This particular subsection should be examined on a national scale in view of the fact that Canadian physicians consider that a capable nurse-midwife must teach family planning.

Medical terminology often tends to be unique to one geographic region (e.g., continental North America), and one particular group of objectives in Part Three were invalidated by the midwifery panel because three midwives stated that the terminology was unfamiliar.

Unnecessary: Physicians Only

One hundred and forty-six objectives were considered "unnecessary" by the physicians, but "necessary" by the midwives. Usually no observable trend, from the content point of view, was evident in these 146 objectives. Only one group of objectives was considered to be "unnecessary" by a large proportion of the physicians and these concerned the observation of a patient during the initial interview. This finding may have to be interpreted in the light of a general comment made by one physician. Questioning the level of practitioner being assessed, he stated that these were skills all nurses should possess and, in fact, some school children might also have them. Even though nurse-midwives are initially nurses this physician was in effect questioning the uniqueness of the skills described.

In general it would appear that if nurse-midwifery is introduced into Canada, the knowledge-skill behaviours validated in this

study could form the basis of a midwifery curriculum and be used as licensing criteria in nurse-midwifery. If these objectives are to be used as licensing criteria, it is important that a test be devised which elicits the same behaviours as those classified by the experts as necessary. Part One of Appendix A (cf. pp. 53-55) was used as the basis of such a test, the results of which will now be described.

Validation of the Criterion Referenced Test

In this study competency is the ability to demonstrate the behaviours cited in the validated objectives. The investigator assumed that simulation was a method by which such behaviours could be elicited. Therefore, it was important to establish the validity of the testing tool developed on the IBM 1500 system. The panel of so-called "experts" who pretested the program completed a questionnaire which presumably measured the face validity of the tool (cf. p. 74, Appendix B). It should be mentioned that only two of the panel were midwives and only one was closely associated with the practice field; however, all were involved in a program associated with midwifery. The questionnaire was also administered to the graduating students in the University of Alberta's Northern Nurse Practitioner program. Although these students had one-third of a four month program devoted to obstetrics and gynaecology as recommended by Kergin (1971), this, in the opinion of the investigator, would be insufficient time to master all the tasks validated as "necessary" for competent midwifery practice.

The simulation program can take over three hours to complete, especially if many irrelevant routes are taken. The subject matter specialists panel did not in fact complete the total program because of the limited time available. It was noted that many members of this panel took routes at random, the reasons for which could be one or more of the following: (1) Members were interested in the capacity of the unfamiliar I.B.M. 1500 system; (2) Members were indirectly measuring the competency of this author; (3) Members were not able to perform competently as midwives.

The student panel completed the total program. It was noted that the students desired more information than was contained in the program. For example they wanted extensive information about otitis media, a condition not generally associated with a pregnancy history. This behaviour may well have been the result of their educational program which prepares them to take an extensive physical history irrespective of the presenting condition.

The response consistency (i.e., reliability) of the questionnaire for both the subject matter specialists and for the students is given in Table 6. A 75% or more consistency level was found in all the experts' responses and one of the student responses. The students had only a 63% consistency level for the questions concerning degree of difficulty. This level did not meet the criterion of 75% or more required for further examination. It would appear that the students were ambivalent in their perceptions of the degree of difficulty associated with taking the test. The students did not assess the

Table 6

RESPONSE CONSISTENCY TO THE QUESTIONNAIRE
(% of Agreement on Specified Pairs of Items)

	Experts	Students
Content Validity	83%*	-
Difficulty Level	75%*	63%
Relevance	77%*	88%*

* Deserves further inspection.

Table 7

FACE VALIDITY ESTIMATED FOR CONSISTENT ITEMS
(% of Subjects Indicating the Simulation
Measured "Necessary" Objectives in Midwifery)

	Experts	Students
Content Validity	83%*	-
Difficulty Level	13%**	-
Relevance	77%*	88%*

* Method has face validity in measuring "necessary" objectives in midwifery.

** Too difficult.

content validity of the test in that they were not considered to be content experts.

The face validity estimates of the consistent items (cf. Table 7) indicate that in the experts' opinion the simulation test was content valid and relevant but too difficult. It should be remembered that few of the specialty group were midwives and this may have had an influence on their perception of difficulty level. The students felt the test was relevant.

The use of simulation as an evaluation tool needs to be explored in greater depth than was attempted in this study. Although the experts have indicated some agreement on the face validity of the simulation, the fact remains that they were not midwives. Therefore, the ability of the investigator to transfer the "necessary" objectives into a simulation testing format has not been assessed by midwives. Nor has it been proven that competent nurse-midwives can achieve a 100% score when taking the test. In other words does the simulation program actually elicit the knowledge-skill behaviours considered "necessary" by the panel of experts? This program cannot be considered a valid testing tool until it has been validated by a group of midwifery experts (at present unavailable in Canada). The specialist group wanted to see the simulation program modified to include a learning format (by introducing positive and negative feedback and including additional learning loops), nevertheless great interest was expressed in this new method of testing.

Conclusions and Recommendations

This study was undertaken to ascertain the "necessary" (cf. pp. 3,4) knowledge and skills required in competent nurse-midwifery practice. An international panel of midwives and a local panel of Canadian physicians reviewed 2437 objectives and decided which met the criteria of "necessary." The criterion for acceptance was rigorous - 75% agreement among midwives and 75% agreement among doctors. Although limitations are placed on the generalizability of the study due to the non-random selection of panel members and the possibility that the criteria established for "necessary" behaviours were not adhered to, the objectives which were validated (considered "necessary") appear to indicate that there is a core of behaviours required for competent nurse-midwifery practice.

It has been pointed out that new work groups in the health field are proliferating (cf. p. 1). As Canada does not recognize nurse-midwives, the introduction of this practitioner might well add to the confusing issue of paramedical specialists. The investigator suggests that the objectives developed in this study provide the tools for an analysis which can be performed before any move is made to introduce nurse-midwives into the Canadian health scene. Several steps would have to be considered in this analysis:

1. Based upon the validated objectives obtained in this study, develop a list of functions to be transferred from physicians to midwives.

2. Obtain the following indices:

   (a) the present proportion of normal and abnormal pregnancies and deliveries,
   (b) the long range predictions of birth rates
   (c) the long range predictions of medical manpower requirements.

3. Develop manpower requirements (midwives and physicians) based upon information from 1. and 2. above.

4. Perform a cost-effectiveness analysis to indicate the feasibility of introducing nurse-midwives into the Canadian health care system.

In view of spiraling health costs, a rational approach to the question of introducing a new health worker, as outlined above, would be of considerable assistance to long range health planners.

If nurse-midwifery is accepted in Canada the validated behavioural objectives could be of considerable assistance in curriculum planning. Core content should be consistent in each nurse-midwifery program irrespective of the location or philosophy of the school. It therefore follows that a knowledge-skill standard could be established for certification and licensure. The evaluation tool developed by the investigator might be extended to incorporate Parts Two to Five of the "necessary" objectives and be used to determine the competency level of the nurse-midwives.

In the opinion of the investigator this type of study is most readily accomplished where functional boundaries exist. In the

case of the nurse-midwife, the boundaries are nursing functions and physician functions, as midwifery tasks encompass nursing and physician behaviours. Using the rationale developed above it is possible that a similar process could be developed for workers in other health care groups, either new groups or those already functioning (e.g., physician's assistant, laboratory technician, respiratory technologist, etc.). Definitive functional boundaries could then be established which would highlight areas of overlapping functions and therefore indicate where transfer of functions could take place.

If, as has been indicated (cf. p. 1), there are problems in identifying and assigning competency levels to specific work groups within the health sector, the method of task analysis developed in this study appears to enable the functions and responsibilities of one work group to be delineated in some detail. Use of this method as a means of assigning functions and responsibilities to other specific work groups could help to clarify the identification and assignment of competency levels among the many groups functioning in the health field.

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APPENDIX A

BEHAVIOURAL OBJECTIVES CONSIDERED

"NECESSARY" FOR

COMPETENT MIDWIFERY PRACTICE

PART ONE

A FIRST PRENATAL VISIT OR THE END OF THE FIRST TRIMESTER

I. All high risk patients are referred to a physician.

II. Interview

A. Socio-economic History

1. Ask the patient the following:

a. age
b. marital status
c. residence location
d. occupation (patient's)
e. husband's occupation

i. Know that a patient has greater incidence of complications and fetal anomalies if she is:

(a) less than 17 years at the time of conception
(b) over 40 years at the time of conception
(c) primigravida of 35 years or more

ii. Know that a patient who is single tends to take less care of physical needs during pregnancy (e.g., nutrition, rest).

B. Medical History

1. Ask the patient if at any time prior to this visit she has had any of the following disease conditions:

a. rubella
b. rheumatic fever
c. tuberculosis
d. nephritis
e. syphilis

i. Know that scarlet fever, rheumatic fever, and diphtheria may cause residual cardiac problems which could be aggravated by pregnancy,
place such a patient in a high risk category

ii. Know that rubella contracted in early pregnancy can cause fetal damage,
place such a patient in a high risk category

iii. Know that tuberculosis (active):

(a) requires the taking of drugs which might have a teratogenic effect on the fetus
(b) requires prophylactic care of the infant at birth

iv. Know that nephritis may cause residual kidney problems,
place such a patient in a high risk category

v. Know that syphilis (if not treated) may cause damage to the fetus,
place such a patient in a high risk category

(a) If a patient had rubella:

(i) ascertain the date the disease was contracted

(ii) if contracted during the early months of this pregnancy, refer to a physician

(b) If a patient has not had rubella

(i) ascertain if they have been in contact with a known case in the early months of pregnancy
(ii) if a contact was made refer to a physician and order a rubella titre

(c) If a patient has had syphilis ensure a serological test for syphilis is done

2. Ask the patient if she is receiving ongoing treatment and supervision for any of the following disease conditions:

a. diabetes
b. heart disease
c. chronic kidney disease
d. circulatory disease
e. anaemia

i. Know that diabetes is an extremely unstable condition during pregnancy and that there are risks of still births or difficult deliveries at term,
place the patient in a high risk category

ii. Know that hypertension and subsequent increased cardiac output can, during pregnancy and the immediate postpartum period, predispose to congestive cardiac failure those patients with heart disease. This would constitute a potential high risk

iii. Know that patients with chronic kidney disease have increased risk of infection and possible renal failure, caused by hypertension and increased activity during pregnancy,
place such a patient in a high risk category

iv. Know that anaemia could result in poor oxygenation of fetal blood cells and inhibit intrauterine growth.

v. Know that chronic circulatory disease can cause increased stress on the heart during pregnancy and predispose toward toxemia.

C. Surgical History

1. Ask the patient if at any time she has had any of the following procedures carried out:

a. pulmonary surgery
b. plastic repair to the genital tract
c. laminectomy
d. repair of fractured pelvis
e. cardiac surgery

i. Know that following pulmonary surgery respiratory function may be diminished

ii. Know that a laminectomy or a spinal fusion may diminish the ability to adjust posture during pregnancy resulting in backaches

iii. Know that a fractured pelvis may have distorted the birth canal and could cause a difficult labor and delivery

iv. Know that the increased activity, induced by pregnancy, on a repaired heart or on one kidney can predispose to cardiac or renal complications, place these patients in a high risk category

v. If a patient has had:

(a) pulmonary surgery
(b) plastic repair to the genital tract
(c) laminectomy
(d) spinal fusion
(e) repair of fractured pelvis

note on the patient's chart that referral should be made during the third trimester for assessment of the ability to delivery normally

2. Ask the patient if she has had any of the following occur alone, or associated with, a surgical procedure:

a. phlebitis
b. thrombosis
c. drug allergy

i. Know that the risk of recurrence of phlebitis or thrombosis is increased during pregnancy, because of hypercoloemia, diminished tone of the walls of the veins and increased fibrin levels toward the end of pregnancy

(a) Observe the patient for varices during the physical examination
(b) Commence teaching related to the prevention of varices

ii. Know that reactions to drug allergies become increasingly severe as the patient becomes sensitized.

If the patient has a drug allergy:

(a) ask the name of the drug
(b) note the drug allergy on the patient's records in a location where it will be easily seen

3. Ask the patient if she has ever had a blood transfusion.

i. If the patient has had a blood transfusion ask if she can remember the reason why it was given:

(a) emergency for haemorrhage
(b) following surgery
(c) because of anaemia

ii. Know that a blood transfusion (especially if given in an emergency situation) may not have been completely cross-matched and antibodies could have been formed

D. Obstetrical History

1. Ask the patient the number of times she has been pregnant

- know that many women forget to count abortions and still births in their pregnancies (therefore check this response by asking the questions a, b, and c)

a. Ask the patient the number of abortions she has had, the weeks at which they terminated and the year in which they occurred

i. Know that the term abortion can be inferred to relate to criminal abortions, therefore check the response by rephrasing the question using miscarriage in place of abortion.

ii. Know that if, prior to this visit, the patient has had three consecutive abortions at twelve to sixteen weeks gestation, an incompetent cervix could be suspected

ii. If an incompetent cervix is suspected, refer to a physician

b. Ask the patient if she has had any still-births, the weeks gestation, the year in which they occurred, and if she was told the cause of death

i. Know that still births can be related to congenital anomalies, maternal diseases or difficult labors and deliveries

ii. If the cause of the still birth is known and associated with a condition that is still present refer to a physician

c. Ask the patient the number of live born infants she has, whether she were multiple births, the weeks gestation and the year of birth

i. Know that a patient para 5 or more can be predisposed to either a precipitate or prolonged labor, and a postpartum haemorrhage,
place such a patient in a high risk category

ii. Know that teenage multiparae and patients with long inter-vals between births tend to have increased incidence of complications in pregnancy, labor and delivery,
place such a patient in a high risk category

d. Know that gravida means the sum of all the pregnancies (including still birth, abortions and the present pregnancy)

e. Know that parity means the sum of all the pregnancies which have terminated after 20 weeks gestation (including still births and those less than 20 weeks if they have been live born)

f. Know that a multiple pregnancy is designated as a para 1

g. From the responses to questions a, b, and c calculate the gravida and parity of the patient being interviewed

h. Know that patients with two or more premature births (including live born and still born) have a greater incidence of the same occurrence,
place such a patient in a high risk category.

2. Ask the patient the type of delivery she had if she was previously pregnant

a. Know that a patient who has had one or more caesarian sections may have a tendency to weakened uterine walls;
place such a patient in a high risk category

b. Know that a patient who has had one or more difficult operative deliveries or one or more prolonged labors (20 hours or more) has an incidence of recurrence,
place such a patient in a high risk category

3. If the patient has had one or more pregnancies, ask if she had any of the following during the antepartum or postpartum period:

a. haemorrhage
b. toxemia
c. kidney infections
d. mastitis

i. Know that a patient who has had toxemia may have a residual hypertension which would increase the risk of toxemia recurring during the present pregnancy and place her in a high risk category

[illegible]

(a) If the patient is not diabetic, ask
(i) the dietary intake she has
(ii) if she has been having problems with nausea and vomiting

(b) If dietary intake is inadequate give nutritional counselling

(c) If nausea and vomiting have caused dehydration and the presence of acetone, refer to a physician.

d Know that protein in the urine is a sign of renal damage or urinary infection

i Check that no contamination of the urine test place from using unclean containers or from vaginal discharge

ii. If urine is uncontaminated refer to a physician.

3. Haematology

1 Take blood for laboratory analysis of:

a. rhesus grouping
b. serological test for syphilis (B.P.B., W.R.A., V.D.R.L.)

i Know that haemoglobin, haematocrit, and red cell count can establish

(a) the presence of anaemia
(b) a baseline from which similar tests taken later in pregnancy can be evaluated

ii Know that blood grouping and rhesus grouping will establish the criteria for subsequent transfusions if they become necessary.

iii. Know that rhesus negative grouping may cause fatal blood incompatibilities if the father of the baby is rhesus positive

iv. If any of the above laboratory results indicate

(a) anaemia
(b) syphilis
(c) rhesus negative

refer to a physician for management.

4 PATIENT TEACHING

1 Commence patient teaching in the areas of:

a. nutrition
b. rest and relaxation
c personal hygiene
d breast care
e. husband and family

2 Know that the giving of information appropriate to individual needs increases the probability of cooperation and decreases the level of anxiety generated by fear of the unknown.

a To teach

i a variety of basic foods and close attention to quality rather than quantity help the patient adjust to metabolic changes

ii there is a relationship between poor nutrition and complications during pregnancy, parturition and in the infant

(a) If the patient does not require a special therapeutic diet (e.g., diabetic), obtain the following information

(i) Family food habits
(ii) cooking preferences
(iii) the budget available

(b) If the quality of the family diet meets the criteria of the Canada Food Rules, reinforce the maintenance of present quality

(c) If the criteria of the Canada Food Rules are not being maintained, suggest adjustments which are practical when related to the family life situation.

b Teach that the pregnant woman requires energy to maintain increased maternal and fetal physiology during pregnancy.

i A plan for extra rest and sleep is formulated with the patient, related to usual habits, age of the patient, occupation and stressing the avoidance of fatigue.

ii Encourage the patient to take daily baths or showers (if impractical a daily sponge bath) to ensure personal hygiene and to encourage relaxation.

c Teach that the breasts may feel full and tense and may increase in size during pregnancy

- In preparation for breast changes encourage the patient to wear a well fitted brassiere which supports rather than compresses and will help retain the normal contour.

d To teach that the biophysical changes which accompany pregnancy can produce the following changes in behaviour for which the husband and family should be prepared.

i. fluctuations in sexual response
ii. mood swings

PART TWO

PRENATAL CARE

I. FREQUENCY OF PATIENT CONTACT

1. For a mother who is not high risk and is having no complications, make appointments for:

a. every six weeks until the 28th week of gestation
b. every four weeks from the 29th to the 32nd week of gestation
c. every two weeks from the 33rd to the 36th week of gestation
d. weekly from the 36th week of gestation of delivery

2. Know that effective prenatal supervision requires regular visits to the attendant by the mother

II. LABORATORY TESTS

A. Urinalysis

1. Perform a urinalysis at each prenatal visit and determine the presence or absence of sugar and/or protein

a. Know that sugar in the urine of a pregnant woman may indicate:

i. a diabetic
ii. a low renal threshold
iii. high carbohydrate intake immediately prior to producing the specimen

b. Know that the simple test for sugar cannot differentiate between glycosuria and lactosuria

c. If sugar is present in the urine:

i. if the urine demonstrates diabetic glycosuria categorize the patient as high risk and refer her to a physician

ii. if the urine demonstrates non-diabetic glycosuria (lactosuria) take no action

d. Know that proteinuria in the urine of a pregnant woman may indicate:

i. toxemia
ii. pyelonephritis
iii. cystitis
iv. leaking amniotic fluid

e. Know that the signs of toxemia are:

i. proteinuria
ii. elevated blood pressure
iii. rapid weight gain
iv. edema

f. Know that the continuation of proteinuria in the urine can lead to permanent renal vascular damage

g. Know that proteinuria associated with

i. back pain
ii. elevated temperature

are signs of pyelonephritis

h. Know that proteinuria associated with

i. urinary frequency
ii. burning pain on voiding

are symptoms of cystitis

(a) If proteinuria is present in the urine of a pregnant woman

(i) check her blood pressure
(ii) check her weight gain
(iii) check for signs of edema
(iv) ask if - she has had frequency
- she has burning pain on voiding
(v) check her temperature

(b) If the woman demonstrates signs and symptoms of

(i) toxemia
(ii) pyelonephritis
(iii) cystitis

refer to a physician immediately

i. Know that leaking amniotic fluid

i. indicates perforation of the fetal membranes
ii. may be an early sign of labor

(a) Ask the woman if she has noticed any persistent leakage of fluid

(b) Ascertain the week of gestation by

(i) calculation of Nagele's formula
(ii) abdominal palpation

(c) If the membranes have ruptured and

(i) the period of gestation is under 36 weeks the woman is categorized as high risk
(ii) the period of gestation is at least 36 weeks provide with preparation for labor

B. Hematology

1. Take blood for a hemoglobin determination

i. at 36 weeks gestation
ii. if a woman complains of

(a) fatigue
(b) weakness
(c) breathlessness
(d) and upon examination is seen to have

(i) waxy nail beds
(ii) pale conjunctiva

a. Know that during the second trimester maternal blood and plasma volumes increase to a level of 40% - 50% above normal causing hypervolemia

b. Know that during the third trimester red blood cell concentrations should return to normal

i. If a hemoglobin concentration is 10.5 grams per 100 ml. or less (irrespective of the period of gestation in which it is taken) the woman is considered to have anemia

ii. Refer to a physician as soon as possible for assessment and treatment

c. Know that signs and symptoms of anemia are

i. breathlessness
ii. fatigue
iii. waxy nail beds
iv. pale conjunctiva

III. EXAMINATIONS PERFORMED

A. General Examination

1. Perform the following procedures at every prenatal visit

a. take the blood pressure
b. weigh the mother
c. palpate the abdomen
d. estimate the height of the fundus

2. At the prenatal visit on and after the 20th week of gestation

a. identify fetal parts
b. ask the patient if she has felt fetal movements

3. At the prenatal visit on and after the 30th week of pregnancy identify the

a. presenting part
b. the position
c. the lie

4. At the prenatal visit in the 36th week of pregnancy perform

a. hemoglobin estimate
b. general physical examination

5. At the prenatal visit on and after the 36th week of pregnancy identify engagement of the presenting part

B. Obstetrical Examination

1. Estimate the weeks of gestation (within a two week period) by knowing the level of the uterine fundus in the abdominal cavity

a. Know that if the fundus of the uterus can be palpated

i. at the level of the umbilicus, the fetus is approximately twenty weeks gestation

ii. one-third of the way between the umbilicus and the xiphoid process of the sternum, the fetus is approximately twenty six weeks gestation

iii. two-thirds of the way between the umbilicus and the xiphoid process of the sternum, the fetus is approximately thirty four weeks gestation

iv. immediately under the xiphoid process of the sternum, the fetus is approximately thirty eight weeks gestation

v. two fingers breadths below the xiphoid process of the sternum while the uterus has a more rounded contour, the fetus is approximately forty weeks gestation

2. Know that a primigravida will become aware of fetal movements at eighteen to twenty weeks

3. Know that a multigravida will become aware of fetal movements at sixteen to eighteen weeks

4. Compare the estimated weeks of gestation found on abdominal palpation with the estimated weeks of gestation using Nagele's formula

a. If the due date of delivery (calculated by using Nagele's formula) and the height of the fundus do not agree

i. Review the menstrual history for a notation of irregular menstruation

ii. Review the record of the previous visit for a notation of previous disagreement on the period of gestation

iii. If there was previous disagreement review

(a) suggested cause
(b) action taken (if any)

b. If disagreement is related to irregular menstruation (as an estimated twenty weeks gestation)

i. Ask the woman

(a) if she has felt the baby move
(b) the day on which movement was first noted

ii. If movement has not been felt, request the woman to make a note of when it occurs and report it at the next visit

iii. If the baby has moved compare the date then recorded with the two estimates of gestation and calculate the estimated gestational age which is compatible with all three findings

c. If the uterus is large for gestational age at twenty weeks (e.g., fundal height is equated with 24 weeks)

i. Review the records of previous visits for a history of

(a) sporadic vaginal bleeding
(b) hypertension

ii. Examine the woman for

(a) edema
(b) hypertension
(c) proteinuria

iii. Palpate the uterus to ascertain

(a) presence of fetal parts
(b) whether the fetus is ballotable

d. Know that the presence of a hydatidiform mole should be suspected if any combination of the above listed signs and symptoms are present

e. Know that a hydatidiform mole may be accompanied or followed by choriocarcinoma, any woman suspected of having a hydatidiform mole is placed in a high risk category

f. Know that a uterus which is large for gestational age after twenty six weeks gestation could be caused by

i. multiple pregnancy
ii. hydramnios
iii. large fetus

- Palpate the uterus to:

(i) identify the fetal parts
(ii) estimate the size of the fetus
(iii) attempt to locate three or more poles (heads and/or buttocks)
(iv) estimate the amount of excess amniotic fluid by ballotting the fetus

g Know that in the presence of excess amounts of amniotic fluid the fetal heart sounds

i are difficult to hear
ii are muffled
iii are distorted causing shivering of the beat

h Know that in a twin pregnancy one or both of the babies may be in abnormal positions causing the fetal hearts to be

i difficult to hear
ii one fetal heart to be superimposed over the other
iii get sounds to be superimposed over the fetal heart sound
iv faint and distant

Listen to the fetal heart sound(s) to identify any sufficiency caused by an excess of amniotic fluid

i Know that hydramnios can be associated with fetal anomalies

j Know that a large fetus is associated with

i a diabetic mother
ii inherited traits of one or both parents

k Know that a woman with a multiple pregnancy could have a pre-mature labor

i If a woman has

(a) a multiple pregnancy
(b) hydramnios
(c) diabetes

place in a high risk category and refer to a physician

ii If a woman has a large baby and no associated complications, note on the prenatal record that a careful assessment of fetal pelvic proportions must be made weekly at and following 36 weeks gestation

5. By palpating the uterus identify the following parts of the fetus

i. head
ii. buttocks
iii. back
iv. limbs

a Know that the fetal head

i is harder than the buttocks

ii. can be ballotted between the examiners thumb and finger or between two hands

b Know that the part of the fetus which is closest to the internal cervical os is called the presenting part

c Know that the relationship of the long axis (vertebral column) of the fetus to the long axis of the mother is called the lie

i If the fetal head is located in the fundus and the buttocks in the pelvis, identify

(a) the lie as longitudinal
(b) the presentation as a breech

ii If the fetal head is located in the pelvis and the breech is in the fundus identify

(a) the lie as longitudinal
(b) the presentation as cephalic

iii If the fetal head is located in one flank and the breech is in the other identify the lie as transverse

d Know that relationship of the fetal parts to the four quadrants of the maternal pelvis is called the fetal position

e Know that the area of the fetal skull circumscribing the sub-occipito bregmatic diameter is called the vertex

f After the 36th week identify the following at each prenatal visit

i. lie
ii. presentation

g Know that engagement in a vertex presentation occurs when the widest diameter of the presenting part has passed through the brim of the pelvis

h Know that engagement of a vertex presentation

i usually takes place two weeks prior to delivery in a primigravida
ii can take place at any time from two weeks prior to delivery up to early labor in a multigravida

(a) At the 36th week of gestation and at each prenatal visit following, identify

(i) the presenting part
(ii) whether or not engagement has taken place
(iii) the ability of the presenting part to engage

(b) If the presenting part is not a vertex place in a high risk category

(c) If engagement of the presenting part has not occurred in a primigravida at an estimated 38 weeks gestation

(i) recheck the accuracy of the calculated due date of delivery
(ii) ask the woman to half sit up from a flat position and assess whether engagement takes place
(iii) ask the woman to stand and assess whether engagement takes place

(d) If engagement still not occur place the patient in a high risk category and make an appointment to be seen by a physician within the next 48 hours

6 Listen to the fetal heart sounds

a Know that the fetal heart is best heard through the fetal back

b Know that the following can be heard through the abdominal wall

i. external abdominal aorta
ii placental souffle

and will have the same rate as the maternal radial pulse

c Know that a fetal souffle has a swishing sound and is the same rate as the fetal heart

i. Palpate the uterus and identify the position and lie of the fetus

ii. Listen

(a) over the fetal back in an anterior position
(b) over the fetal chest in a posterior position

iii. Discriminate between

(a) external abdominal aorta
(b) fetal heart sounds

7. Record patient weight at each prenatal visit

8 Compare present weight to last recorded weight

a Know that sudden weight gain may

i be caused by increased calorie intake
ii be caused by retention of tissue fluids
iii be associated with toxemia

b Know that an obese woman, maintaining a well balanced nutritional diet may not gain weight

c Know that a malnourished underweight woman maintaining a well balanced nutritional diet may gain weight an excess of 1/2 lb. per week

i. If a woman has a sudden weight gain in excess of 1/2 lb. a week

(a) ask the woman to describe her dietary intake during the previous two weeks

(b) observe ankles and fingers for signs of edema

(c) compare present blood pressure with the last recorded pressure

(d) check for proteinuria

ii. If the sudden weight gain is associated with edema, proteinuria, and hypertension, suspect toxemia and place in a high risk category

iii. If the sudden weight gain is associated with increased calorie intake conduct the patient in ways to reduce the calories which will fit same her eating habits

iv. If the woman is malnourished and has a steady weight gain in excess of 1/2 lb a week

(a) check the woman's record to assess when the weight gain commenced

(b) ask the woman if she has made changes in her dietary intake from that prior to pregnancy

(c) if no edema, hypertension or proteinuria are associated with the weight gain check weight gain at each visit to ensure that it does not go above the ideal range indicated

9. Take the woman's blood pressure at each prenatal visit

i. record the reading
ii. compare present blood pressure with pressure last recorded

a Know that during the maintenance of a normal pregnancy the blood pressure tends to be below the pregnant level

i. If there is a rise of 30 mm or more to the systolic blood pressure and 15 mm or more to the diastolic blood pressure from the recording made at the last visit

(a) suspect pre-eclamptic toxemia
(b) check whether proteinuria and/or edema is present
(c) place patient in the high risk category

ii. If no previous blood pressure recording is available a morning blood pressure of 140/90 and over could be associated with

(a) hydatidiform mole
(b) essential hypertension
(c) pre-eclamptic toxemia

and places the woman in a high risk category

iii. If all symptoms of pre-eclamptic toxemia are present refer to a physician immediately

iv. If no other signs or symptoms associated with the hypertension make a physician's appointment within 48 hours

III. MANAGEMENT OF CARE

1. Instruct each patient to report any of the following symptoms immediately

i. severe headache
ii. blurring of vision
iii. tightness of chest
iv epigastric pain and nausea

a Know that any of the above listed symptoms could indicate toxemia which is rapidly increasing in severity

b Know that severe headache, nervous irritability and blurring vision are symptoms of intracranial pressure indicating cerebral edema and predisposing to eclampsia

c Know that tightness of the chest and epigastric pain and nausea are symptoms of pressure of an enlarged liver and warning signs of approaching eclampsia

d. Know that a severe headache can be caused by

i. tension
ii. migraine
iii. eye strain

e Know that nervous irritability can be associated with edema and toxemia

f. Know that tightness of the chest could be associated with a cold or influenza

g Know that epigastric pain and nausea can be caused by acute indigestion

i. Instruct the woman as quickly as possible and note

(a) blood pressure
(b) urinalysis
(c) admit

ii. If the signs and symptoms confirm the diagnosis of toxemia place the woman in a high risk category and refer to a physician immediately

a. Know that there is no known etiology of toxemia but that women with one or more of the following characteristics have a greater probability of acquiring toxemia

i. come from the lower socio-economic groups
ii. is less than 17 years
iii. is a primigravida more than 35 years
iv. is a primigravida
v. is obese
vi. has diabetes with vascular or renal involvement
vii. has acute hydramnios

b. If a woman exhibits

i. weight gain of more than 1/2 lb. per week
ii. or some early edema

and these are suspected to be prodromal signs of toxemia

c. make an appointment to re-examine the woman in one weeks time
ii. if signs of toxemia remain refer to a physician

2. Instruct any patient to report any sign of bleeding

a. Know that during the first half of pregnancy bleeding may be caused by

i. a threatened abortion
ii. an ectopic pregnancy
iii. a hydatidiform mole
iv. a cervical erosion

(a) If a patient reports

(i) heavy blood loss
(ii) external blood loss and associated abdominal pain

refer to a physician immediately

(b) If a patient reports

(i) mild spotting of blood
(ii) no associated abdominal pain

refer to a physician to be seen within 12 hours

b. Know that during the last half of pregnancy bleeding may be caused by

(i) a placental previa
(ii) abruptio placenta
(iii) cervical erosion

i. If a woman reports that she is bleeding ask

(a) how much blood has been lost (how many sanitary pads have been used)

(b) how long has the been bleeding

(c) is there any pain

(d) what is the baby due

ii. Examine the woman as soon as possible

(a) ascertain the extent of the blood loss
(b) check the woman's pulse rate
(c) check the woman's blood pressure
(d) if beyond 22 weeks gestation:

(i) palpate the uterus to establish whether there is any uterine rigidity or pain
(ii) check the fetal heart

c. Know that if one sanitary pad has been used in four hours, blood loss is minimal

d. Know that if no more than four sanitary pads have been used in an hour, the blood loss is moderate

e. Know that if a sanitary pad is inadequate for containing the blood loss the hemorrhage is severe

f. Know that a moderate blood loss over a few hours can equal a major hemorrhage of a few minutes

g. Know that blood loss associated with pain may be caused by

i. blood pooling between the placenta and the uterine wall
ii. blood infiltrating into the muscle fibres
iii. contraction of the uterine muscles

h. Know that bleeding associated with an ectopic pregnancy or an abruptio placenta could be hidden (internal) as well as external

i. Know that if bleeding is caused by the premature separation of a normally implanted placenta (abruptio placenta) there may be associated

i. localized painful area on the uterus if the bleeding is minimal
ii. rigidity of the uterine muscles if bleeding is heavy

j. Know that if a severe abruptio placenta has occurred or there has been complete separation of the placenta the fetal heart may not be heard

k. Know that if bleeding is caused by the separation of an abnormally implanted placenta (placenta previa)

i. the uterus will be soft
ii. the woman will not have any associated pain

l. Know that excessive bleeding and/or continuous moderate bleeding can cause

i. tachycardia
ii. hypotension

m. Know that because of hypervolemia in pregnancy hypotension may not be an accurate estimate of the severity of the hemorrhage

n. Know that any bleeding which does not necessitate frequent changes of pads and occurs

(i) within two weeks of the due date of delivery
(ii) at the same time as a heavy show/ vaginal discharge

could be "show" and associated with signs of early labor

i. Any patient with a moderate or severe hemorrhage is placed in the high risk category and referred to a physician immediately

ii. Refer a patient with a slight bleed to a physician for assessment

iii. If a patient has "show" make preparation for delivery

iv. If the patient is hemorrhaging

(a) do not perform any type of pelvic examination
(b) arrange for rapid transfer to a location with the appropriate facilities for

(i) surgical interference
(ii) care of an unplanned baby
(iii) support services for a woman in shock

(c) if available administer plasma expanders intravenously until cross matched blood is available

3. Instruct each patient to report any escape of fluid from the birth canal

a. Know that if the membranes rupture within two weeks of the estimated date of delivery it could be a sign of labor commencing

b. Know that if the membranes rupture prior to thirty eight weeks gestation

i. it may be a sign of premature labor commencing
ii. it may be associated with friable amniotic membranes and an inner sheath

(a) if the woman is at term make preparation for delivery
(b) if the woman is less than 38 weeks gestation there is a danger of premature labor and/or infection which places her in a high risk category, refer to a physician immediately

c. Know that if the membranes rupture and

(i) the presenting part is not engaged
(ii) the woman has hydramnios
(iii) there is an ill-fitting presenting part

there is a danger of the umbilical cord prolapsing

i. Check the vulva for signs of a prolapsed cord
ii. Check the fetal heart for signs of fetal distress
iii. If the umbilical cord has prolapsed the woman and fetus are in the high risk category
iv. If the umbilical cord has not prolapsed and the fetal heart is regular and between 120-160 beats a minute

(a) confine the woman to bed
(b) observe closely for

(i) prolapse of cord
(ii) signs of labor

d. Know that fetal distress can be detected by listening to the fetal heart for

i. irregular rhythm
ii. 160 beats per minute and over
iii. 120 beats and under per minute

e. Know that amniotic fluid

i. is a clear straw color
ii. is alkaline

f. Know that if the membranes have been ruptured for twenty four hours or longer the probability of intra-uterine infection rapidly increases. Refer to a physician immediately

g. Know that meconium in the amniotic fluid

(a) gives the fluid a greenish tinge if fresh
(b) gives the fluid a yellow tinge if stale
(c) has laxative

(i) a breech presentation
(ii) fetal distress

i. Confirm the drainage of amniotic fluid by

(a) observing the color
(b) testing the odor
(c) observing an alkaline reaction on litmus paper

ii. If the fluid is green or yellow

(a) listen to the fetal heart sounds for signs of distress
(b) palpate the uterus to diagnose the presentation

iii. If meconium is present in the amniotic fluid and if fetal distress is detected

(a) place the fetus in a high risk category
(b) refer to a physician immediately

4. Instruct the patient to report any vaginal discharge at her prenatal visit.

a. Know that common causes of vaginal discharge during pregnancy are

i. candidiasis
ii. trichomoniasis
iii. gonorrhoea
iv. bacteriosis

b. Know that

i the acid medium favors the growth of yeast organisms which result in vaginal infections (candidiasis)

ii if untreated, vaginal infection can be transmitted to the infant at delivery and cause thrush

c. Know that

(a) a heavy discharge which necessitates wearing a sanitary pad may cause reddening and excoriation of the vulva

(b) a discharge causing irritation may produce vulval edema and excoriation

(c) a strong odor can be personally offensive

i Ask the woman who complains of vaginal discharge

(a) how long is the discharge
(b) do you have to wear a sanitary pad
(c) does the discharge

(i) cause irritation
(ii) have an offensive odor

ii. Examine the woman's vulva for

(a) reddening
(b) edema
(c) excoriation

iii. Examine the discharge observed in the speculum for

(a) color
(b) consistency
(c) odor

iv. Unless a unit has a referral to a physician for differential diagnosis and treatment for those patients who have a discharge

(a) which is foul smelling
(b) which has caused reddening and excoriation
(c) which has an offensive odour

d. Know that trichomoniasis and gonorrhoea can be transmitted during sexual intercourse. Advise the woman

i. that her sexual partner may require treatment
ii. to refrain from sexual intercourse until treatment is completed

5. Instruct the woman to report any urinary frequency accompanied by a burning sensation or associated with a backache and a fever

a. Know that physiological changes during pregnancy can cause

i. urinary stasis
ii. which predisposes a woman to
(a) cystitis
(b) pyelonephritis

b. Know that the following are signs and symptoms of pyelonephritis

i. pain in the lumbar region radiating to the right side
ii. nausea
iii. vomiting
iv. dysuria
v. frequency
vi. pyrexia
vii. general malaise

c. Know that the following could be symptoms of early labor

- pain in the lumbar region radiating anteriorly

d. Know that labor progresses with regular uterine contractions and cervical dilatation

i. Ask the patient to list her symptoms
ii. Take the woman's temperature
iii. Refer a woman with suspected pyelonephritis or cystitis to a physician for treatment within 24 hours

6. Ask the woman at each prenatal visit whether she has anything which is causing her minor discomfort, such as

i. backache
ii. constipation
iii. swelling ankles
iv. fatigue
v. haemorrhoids

a. Know that backache can be due to stress on the spinal column and back muscles brought about by

i. adjustments in posture caused by the growing fetus and the enlarging uterus
ii. alteration in the centre of gravity

(a) If backache is severe and constant

(i) check the woman's past medical and surgical history for treatment of back problems
(ii) if there has been a previous problem refer to a physician for assessment within 7 days
(iii) check for symptoms of urinary infection

(b) If the backache is mild and sporadic advise the woman to

(i) wear low heeled shoes
(ii) when standing to tilt the hollow sacrum in and to stand erect with head held high
(iii) squat with one foot ahead of the other instead of bending

(c) If backache occurs in the morning

(i) ask the woman if the mattress on her bed sags
(ii) if the mattress sags suggest the use of a board under the mattress to give support

b. Know that constipation can become a problem during pregnancy

i. when a woman does not have regular bowel habits
ii. because physical activity is decreased
iii. because, during the last few weeks of pregnancy there is pressure on the descending part of the lower bowel causing congestion

c. Know that laxatives, suppositories and enemas can stimulate peristaltic activity of the large intestine which could stimulate the uterine muscles to contract

i. Advise the woman, who is constipated, to

(a) train the bowels to act regularly
(b) increase the amount of roughage in her diet (green leafy vegetables, cereals, etc.)
(c) include fruits in her diet (figs, prunes, dates)
(d) drink eight or more glasses of water a day
(e) obtain daily exercise through walking

ii. Instruct the woman not to use any laxatives, suppositories or enemas on a self medication

d. Know that constipation aggravates haemorrhoids

e. Know that haemorrhoids are varicosities in the anal region and can be the result of

i. increased pressure and dilatation of the haemorrhoidal vein
ii. the enlarging uterus obstructing venous return

f. Know that thrombosed veins can cause pain and irritation

i. Advise the woman that constipation should be avoided

ii. Advise the woman that witch hazel compresses to the affected area could bring some relief from pain and irritation

iii. If pain and irritation are severe refer to a physician for more extensive treatment within 7 days

g. Know that palpitations of the heart and shortness of breath can be associated with

i. hypervolemia
ii. enlarging uterus causing pressure on the thorax
iii. heart disease

- Refer a woman with severe palpitation and shortness of breath to a physician within 24 hours for a check of possibly rheumatic heart disease

h. Know that swelling of the ankles can be associated with

i. increased placental and adrenal hormones circulating in the blood stream causing sodium and fluid retention
ii. increased venous pressure caused by prolonged standing
iii. changes in temperature (summer heat) causing mild fluid imbalance
iv. varicose or round garters restricting circulation
v. deficient protein intake
vi. toxemia

i. Know that swollen ankles tend to occur more frequently during the second half of pregnancy

i. Check the woman for signs of toxemia (weight gain, proteinuria, hypertension)

- If toxemia present the woman is placed in the high risk category

ii. Ask the woman

(a) if she has to stand for long periods
(b) if she wears round or elastic garters
(c) whether or not she has altered her nutritional intake during the previous two weeks

iii. Advise the woman to

(a) avoid constricting clothing (tight garters)
(b) plan for rest periods when legs could be elevated
(c) make adjustments to her nutritional intake if it was found to be imbalanced (restrict sodium, increase protein)

j. If a woman complains of feeling tired

i. check the woman's haemoglobin
ii. instruct the mother

(a) in methods by which she can relax
(b) to lengthen the amount of sleep during the night

iii. Explain the reasons for the need for more sleep and rest during pregnancy

k. Know that heartburn is caused by the regurgitation of gastric contents into the oesophagus and

i. tends to occur between sixteen weeks to twenty weeks gestation
ii. increases in severity during the third trimester
iii. is aggravated by lying down

- Advise the mother

(i) to eat small meals frequently and slowly
(ii) to avoid fried foods
(iii) not to lie down directly after eating

11 PATIENT TEACHING

1. Teach the woman nutritional changes which are required by her progressing pregnancy

a. Know that two-thirds of fetal growth occurs during the second trimester

b. Know that extra nutrients are required for building fetal tissues and for meeting increased metabolic needs in the mother

c. Know that one quart of milk can furnish over three-quarters of a day's calcium requirements

- Assure the mother that both calcium and protein can be gained from

(a) a daily serving of meat with preference given to liver
(b) the addition of one or two eggs to the daily intake
(c) increased intake of milk products
(d) use of whole grain cereal

d. Know that during the third trimester care must be taken that the mother does not gain too much weight

i. Explain changes in the woman's diet by

(a) the amount of weight being gained
(b) the woman's individual energy requirements

ii. Recommend that in between meal snacks should consist of raw vegetables and fresh citrus fruits

e. Know that sodium may not be well metered during pregnancy resulting in edema

i. Advise the woman to reduce her salt (sodium chloride) intake

ii. Review with the woman foods which should be restored when salt is restricted. For example

(a) packaged and canned soups
(b) peanut butter
(c) soft drinks

iii. Instruct the woman to

(a) examine the labels on packaged foods
(b) avoid those that contain sodium chloride

2. Teach the woman during the second trimester about

i. Braxton-Hicks Contractions
ii. quickening

a. Know that

i. the uterus is constantly contracting and relaxing
ii. during the mid-trimester the contractions are generally below the woman's level but an occasional sensation of tightening is felt
iii. during the third trimester the sensation of tightening may be perceived at a higher level and associated with a backache or mild discomfort

b. Know that the painless contractions of pregnancy

i. are called Braxton-Hicks Contractions
ii. are more likely to be perceived by the mother when she is at rest
iii. can be stimulated during uterine palpation

(a) Teach the mother that

(i) Braxton-Hicks Contractions will occur during pregnancy
(ii) the contractions are a normal pattern
(iii) they are not labor contractions
(iv) she will become more aware of them as pregnancy progresses

(b) If a contraction occurs during an examination

(i) identify it for the mother
(ii) encourage her to feel her abdomen and identify the tightening uterus

c. Know that the fetus becomes strong enough for the mother to feel intra-uterine movements

i. at sixteen to eighteen weeks as a multigravida
ii. at eighteen to twenty weeks as a primigravida

d. Know that fetal movements felt by the mother for the first time are often called "quickening"

e. Know that the time of perception of quickening can assist in determining the due date of delivery.

- Teach the woman

(a) when quickening could be expected to occur
(b) the importance of remembering the time that quickening occurs
(c) that quickening is more likely to be noticed when the mother is at rest

f. Know that minor patterns of rejection occur during pregnancy and are considered a normal emotional reaction

g. Know that the following situations can motivate rejection

i. the physical environment of the home situation
ii. social pressures of work, value systems and life styles
iii. emotional immaturity in the pregnant woman
iv. rejection of the feminine and maternal role by the pregnant woman
v. the relationship of the pregnant woman with her mother

(a) If motivational situations for rejection are elicited from the woman's history and/or conversational cues encourage her to express her feelings by

(i) expressing an understanding of the difficulties this pregnancy has created
(ii) returning a statement made by the mother in the form of a question
(iii) allowing the woman to feel that she is not pressured by time

(b) Accept the woman of the normalcy of her feelings

(c) Refer the woman to an appropriate agency if there is a specific problem (e.g., money, work)

h. Know that a denial pattern of rejection can change after the mother becomes aware of fetal movement

3. Teach exercises for relaxation and childbirth commencing in the second trimester

a. Know that if a woman is able to relax she will be able

i. to rest during her pregnancy
ii. to maintain her energy during labor and delivery

(a) Instruct the woman

(i) to assume a position on her side which is comfortable (upper leg bent more than the lower, head on one pillow, lower arm behind her head)
(ii) tense muscles in one leg and relax and alternately tense and relax isolated muscles in other leg, arms, back, abdomen, neck and face
(iii) relax all muscles and with eyes closed rest quietly for ten minutes.

(b) Suggest to the woman that she practice relaxation before sleeping at night.

b. Know that if a woman is able to change her breathing patterns to conform to differing contractions she will be able to cope with the contractions

c. Know that for exercises to be effective they must be practiced in order that the woman can maintain control during labor and delivery

d. Know that husbands can be effective coaches of prenatal exercises

e. Know that deep intercostal breathing allows for

i. increased oxygenation during early labor
ii. aids in abdominal relaxation

(a) Encourage the husband to be present when the wife is being taught her prenatal exercises

(b) Instruct the woman to

(i) lie on her back
(ii) place her hands on the lower rib cage with finger tips touching
(iii) take a deep breath in and attempt to make the touching finger tips part and then to breathe out
(iv) repeat the exercise breathing regularly and slowly

iii. Tell the woman and her husband that this exercise is to be done during contractions when labor concentrates being to her back

f. Know that abdominal breathing

i. reduces thoracic tension during the latter part of labor
ii. lifts the abdominal wall away from pressure on the uterus

(a) Tell the woman and her husband that this exercise is to be done

(i) when the contractions are closer than every 3-5 minutes
(ii) throughout the length of the contraction

(b) Instruct the woman

(i) to lie on her back
(ii) breathe in slowly and lift the abdominal wall at the same time
(iii) breathe out and relax the abdominal wall
(iv) repeat the exercise breathing regularly and very slowly

(c) Place hands on the abdomen and check that the exercise is being done correctly

g. Review exercises with the mother at each prenatal visit and assess the amount of increase or skill from the previous visit

4. Teach the woman the changes that are occurring in her baby during pregnancy

a. Know that being able to imagine what the fetus looks like makes it more real for the mother

i. Ask the mother if she would like to listen to her baby's heart beat, and if she wishes to,

(a) locate the fetal heart, using an appropriate fetoscope or stethoscope

(b) place the stethoscope on the mother's knee

ii. from thirty-four weeks gestation identify for the mother the parts of the baby being felt during uterine palpation

5. Discuss methods of infant feeding with the mother

a. Know the mother's infant feeding preferences on her record

b. Know that if a mother has no particular preference for one method the value of breast feeding should be explained

c. Know that the stimulation of sucking causes the release of oxytocin from the anterior pituitary gland which causes contractions of the uterine muscles

- Tell the mother that if she decides to breast feed her baby

(a) she will help to meet both her own and her baby's emotional needs

(b) the close relationship established between her and the baby before delivery will be continued

(c) the baby gains satisfaction through the warm skin to skin contact

(d) the action of the baby sucking helps the uterus return to its prepregnant size and shape more [illegible]

6. Examine the mother's nipples if she wishes to breast feed

a. Know that it is difficult for the baby to suck on inverted nipples

b. Know that mild stimulation causes eversion of the nipple

- If the mother's nipples are inverted

(a) demonstrate how, by gentle traction, the nipple can be everted

(b) teach the mother that if this exercise is done twice a day, every day, by the time delivery takes place the baby should be able to grasp the nipple

c. Know that colostrum may be expressed from the breasts by the thirteenth week

d. Know that the secretions of colostrum can have a sweet on the nipples

i. Express colostrum from the breast and demonstrate to the mother how her body is preparing for lactation

ii. Teach the mother the importance of washing the nipples daily and removing traces of colostrum

7. During the third trimester instruct if - women in preparation for the onset of labor

a. Know that many women

i. fear for their safety during labor and delivery
ii. have vague ideas concerning the process of delivery
iii. are afraid of the unknown

b. Know that preparation for labor influences attitudes toward, and progress made, during the intrapartum period

i. Encourage the mother to ask questions by asking

(a) what old wives tales she may have heard

(b) if her own experiences, or those related by others have concerned distressing experiences of labor and delivery

ii. Refute the old wives tales and explain how they came about

iii. Allay fears of the occurrence of distressing experiences in labor and delivery by

(a) assessing with her the present status of her pregnancy
(b) estimating the probabilities of a normal outcome
(c) being completely honest in answering questions
(d) giving information which will help the mother master her inner fears

c. iv. Instruct the mother in signs of approaching labor

(a) lightening (engagement of presenting part)
(b) show
(c) persistent backache
(d) rupture of membranes

v. Tell the woman how labor may start

(a) an sporadic low back discomfort radiating to the front
(b) as distinct contractions
(c) with rupture of membranes

vi. Instruct the mother and her husband how to time her contractions

(a) look at a watch when the contraction begins and again when the next contraction comes

(b) make a note on a pad of the times

(c) calculate the interval between them

vii. Tell the mother to report when her contractions are 5 to 5 minutes apart and regular.

PART THREE

LABOR AND DELIVERY

I. [illegible]

A. Interview with the patient.

1. Ask the mother if

i. she is having contractions
ii. her membranes have ruptured
iii. if she has had any "show"

a. Know that contractions could occur with false labor

b. Know that uterine contractions

i. of increased strength
ii. of increased length
iii. of increased frequency

are indications of true labor

c. If the mother states that she is having contractions, ask

i. the frequency of contractions
ii. the length of contractions
iii. the time the contractions commenced a regular pattern

(a) Observe the length, strength, and frequency of contractions at time of first contact
(b) Calculate the progress of labor by comparing observations with patient's reported history

d. Know that membranes can rupture prematurely and prior to labor

i. If the mother states that her membranes have ruptured ask

(a) the time they ruptured
(b) the amount and color of the discharged fluid

ii. Calculate the length of time the membranes have ruptured

e. Know that if the membranes have been ruptured for 24 hours or more the risk of infection (to the fetus and/or amniotic) increases with each hour that the bulbo remains undelivered and no prophylactic treatment has been commenced

- If membranes have been ruptured for 24 hours or longer refer to a physician immediately for prophylactic treatment and/or induction of labor

f. Know that it is possible for a mother to accidently identify hemorrhage as show

i. Check the amount of blood loss at the time of first contact
ii. Observe the amount of vaginal discharge during the following hour
iii. If the patient is bleeding refer her to a physician immediately

2. Check the patient's record for the history of

i. past pregnancies
ii. present pregnancy
iii. complications of present pregnancy
iv. estimated date of delivery

a. Know that a primigravida will probably have one-third longer labor than a multigravida

b. Know that after five centimeters the uterine muscles of a multiparous patient would last twice and the labor would be longer

- Observe for signs of deathtocy labor

c. Know that where the previous labor and delivery was under four hours it could be predicted that the present labor and delivery could be four hours or less

- Make preparation for a rapid or precipitate labor and delivery

d. If the mother has been designated as a high risk, transfer patient to a physician's care

e. Know that if the mother is thirty-eight weeks gestation or less she is designated as being in premature labor

- Transfer patient to a physician's care immediately

3. Check the laboratory reports in the patient's record

a. Know that a patient who is anemic when the uterus labor has a greater possibility of

i. intrapartum hemorrhage
ii. postpartum hemorrhage
iii. postpartum fatigue

- If the hemoglobin level falls within two weeks of the time of delivery to less than 11 gm. transfer patient to a physician for management of delivery

b. Know that a patient who has had pyelonephritis during labor (associate with a mild bacteria) could exhibit increasingly severe symptoms of toxemia during pregnancy

- Refer to a physician for management of delivery

c. Know that if there has been a weight gain equal or greater than 20 lbs. (9 kgs) during pregnancy, the mother could begin to exhibit symptoms of toxemia during labor

i. Obtain uncontaminated specimen of urine and test for proteins after each voiding during labor
ii. During labor take the blood pressure every two hours
iii. Observe the hands and face for signs of edema
iv. If any signs of symptoms of pre-eclamptic toxemia are detected, refer to a physician immediately

II. [illegible]

A. Fetal Vital Signs

1. Listen to fetal heart sounds every

i. hour during early labor
ii. half hour when contractions are between seven minutes and four minutes apart
iii. fifteen minutes when contractions are between four minutes and two minutes apart
iv. five minutes or between contractions during the second stage

2. When listening to the fetal heart sounds

i. count the rate
ii. note the rhythm

a. Know the signs of fetal distress (see Part One)

b. Know that the possibility for the occurrence of fetal distress increases as labor progresses

c. Know that there is a natural slowing of the fetal heart rate during a contraction

d. Know that the regular fetal heart rate should be regained within 5 seconds of the completion of a contraction

i. Listen to the fetal heart for a full minute
ii. If there is a probability of fetal distress occurring, increase the frequency of taking the fetal heart

e. Know that changes in the fetal heart rate can be associated with a diminished oxygen supply

f. Know that oxygen can be prevented from reaching the fetal circulation by

i. maternal cardiac problem
ii. maternal respiratory problem
iii. premature separation of the placenta
iv. cord compression
v. malformations in the fetal circulatory system

g. If symptoms of fetal distress are demonstrated

i. estimate the stage of labor
ii. observe the mother for conditions which could cause distress
iii. administer oxygen to the mother as a prophylactic measure
iv. recheck the fetal heart sounds every five minutes
v. refer the patient to a physician immediately

h. Explain to the mother the reason for administering the oxygen

i. Remain with the mother constantly until the physician assumes responsibility and keep her informed of progress

B. Maternal Vital Signs

1. Time uterine contractions when the fetal heart is checked

a. Know that the normal pattern of uterine contractions

i. commence in the fundus
ii. progress in a wave to the uterine isthmus
iii. regress towards the fundus

b. Know that abnormal contraction patterns can cause delay in the progress of labor

i. Place a hand on the fundus to assess uterine contractions
ii. If uncoordinated uterine action is suspected, place one hand over the uterine fundus and the other suprapubically and note the origin of the contraction

c. Know that the length of a contraction is calculated from the time the uterine muscles become contracted to the time when the uterine muscles commence to relax

d. Know that contractions that last longer than 90 seconds could diminish the oxygen supply to the fetus

e. Know that the frequency of a uterine contraction is calculated from the commencement of one contraction to the commencement of the next

f. Know that to accurately time the frequency of contractions more than three contractions should be monitored

i. If contractions are occurring closer than two minutes apart and last longer than 60 seconds

(a) check the fetal heart rate
(b) estimate the stage of labor
(c) observe the mother for signs of exhaustion

ii. Decide whether

(a) vaginal delivery is possible
(b) hypertonic contractions are present
(c) placental separation is suspected

iii. If delivery is not imminent

(a) refer patient to a physician immediately
(b) describe the signs and symptoms present

g. Know that when a contraction occurs the uterine muscles retract and assist in the dilatation of the cervix

2. Record the maternal temperature, pulse and respiration every four hours while in labor

a. Know that an elevated temperature (1°F over the normal range) could be

(i) due to infection
(ii) or dehydration

i. If infection is suspected

(a) ask the mother for specific symptoms which she may have
(b) check the mother for signs of

(i) restlessness
(ii) contagious children's diseases
(iii) diarrhea (GI), chorea)

ii. If dehydration is suspected check the mother's urine for the presence of acetone

- If present increase the mother's fluid intake (orally or by I.V.)

b. Know that dehydration diminishes the effectiveness of the uterine contractions

- As a prophylactic against dehydration maintain fluid intake throughout labor

(i) orally and/or
(ii) intravenously

c. Know that an increase in pulse rate to 100 beats per minute or above during labor could be due to

i. internal hemorrhage
ii. dehydration

- If internal hemorrhage is suspected

(a) check fetal heart rate
(b) palpate the abdomen for signs of rigidity of abdominal muscles, localized area of acute pain

(c) observe vaginal discharge for signs of fresh blood
(d) report findings to a physician immediately
(e) and transfer patient to his management

d. Know that signs and symptoms of trauma may become revealed as labor progresses

i. Check the mother for signs of trauma

ii. If signs of trauma are observed report findings to a physician immediately and transfer patient to his management

e. Know that a sudden drop in blood pressure accompanied by a complaint of faintness

(a) may be caused by the weight of the pregnant uterus resting on the inferior vena cava when the mother is in the recumbent position
(b) may be due to a drug reaction

i. Maintain a constant check on the maternal pulse rate
ii. Observe the mother for pallor and syncopia
iii. Retake the blood pressure within five minutes
iv. If the blood pressure level improves

(a) the patient's color returns to normal
(b) and the maternal pulse maintains a regular tone

encourage the mother to remain in a lateral position for the remainder of the labor

v. If the blood pressure level remains low check the patient's record for

(a) any drug which had been given recently
(b) any history of allergies

vi. If anaphylactic shock is suspected

(a) refer to a physician immediately
(b) prepare to give resuscitative care if required

3. Synthesize the observed vital signs and maternal response to labor to calculate the possibility of maternal exhaustion

a. Know that maternal exhaustion may precipitate fetal distress; if maternal exhaustion is suspected increase the frequency of observing the fetal vital signs to every 15 minutes

b. Know that

i. dehydration
ii. intermittent uterine activity
iii. cephalo-pelvic disproportion
iv. abnormal presentation
v. rigid pelvic musculature and weak uterine contractions

can lead to prolonged labors and possible maternal exhaustion

c. If a labor appears to

i. require augmentation
ii. show signs that obstruction is present

refer to a physician immediately for continuing management

C. Obstetrical Examination

1. Perform a rectal or vaginal examination

a. Know that progress in labor can most accurately be measured by an internal examination

b. Know that effacement of the cervix

i. means the thinning of the cervical canal
ii. occurs prior to delivery in a primigravida
iii. can occur concurrently to labor in a multigravida

c. Know that dilatation of the cervix

i. means the opening of the cervical os
ii. is a definitive part of labor
iii. occurs in conjunction with and because of uterine contractions

d. Know that the rate of cervical dilatation is influenced by

i. effacement of the cervix
ii. parity
iii. strength, length and frequency of uterine contractions
iv. pressure from the presenting part

(a) Locate the external os of the cervix by digital examination
(b) Use the use of fingers estimate the amount of dilation and record estimate in centimeters
(c) Estimate the degree of effacement by feeling the consistency of the cervix and determining the thickness of the cervical canal

e. Know that if the membranes have not ruptured the amniotic sac

i. can be felt through the cervix
ii. can be felt to bulge during a contraction
iii. could be mistaken for the molded scalp of a vertex presentation

(a) Determine the tension of the amniotic sac
(b) If the membranes are ruptured observe the color and odor of fluid which drains during the examination and compare with the criteria of normal amniotic fluid

f. Know that presentation and position of the fetus diagnosed on abdominal examination can be confirmed during an internal examination

g. Know that in a vertex presentation the identification of the sutures and fontanelles on the fetal head confirm the position

h. Know that

i. four sutures enter the anterior fontanelle making it diamond shaped
ii. three sutures enter the posterior fontanelle making it triangular shaped
iii. the sagittal suture links the anterior and posterior fontanelle

(a) confirm the vertex presentation and identify the

(i) sagittal suture
(ii) the posterior fontanelle
(iii) the lambdoidal suture
(iv) the anterior fontanelle

(b) Establish the location of the occiput and relate it to the quadrant of the mother's pelvis in order to establish the fetal position

i. Know that molding is overriding of the sutures by the fetal skull bones

j. Know that with descent of the fetus through the pelvis pressure is exerted on the fetal skull causing molding

k. Know that excessive molding is associated with cephalo-pelvic disproportion

l. Know that abnormal molding is associated with malpresentation

m. Know that a caput succedaneum is a collection of fluid in the fetal scalp which is circumscribed by the cervical os

i. If a gross change in molding is diagnosed

(a) assess the progress of labor
(b) check the pelvic assessment for signs of suspected disproportion
(c) observe for signs of

(i) maternal exhaustion
(ii) fetal distress

ii. If cephalo-pelvic disproportion is suspected refer to a physician immediately

iii. Differentiate between excessive molding and a caput succedaneum

iv. Differentiate between a caput succedaneum and a tumor embolis tus

n. Know that descent of the fetus takes place throughout the course of labor

o. Know that the level of the presenting part in the pelvis is estimated by its relationship to the ischial spines

p. Know that if the vertex is at station 0 engagement of the presenting part has taken place

i. Locate the ischial spines by digital examination
ii. Identify the station of the presenting part
iii. If a primigravida commences labor with the presenting part at spines -1, observe closely for signs of

(a) cephalo-pelvic disproportion
(b) ineffectual contractions
(c) lack of descent as labor progresses
(d) descent with excessive molding

iv. If there are signs of delay and inadequate descent of the fetus after labor has been established for two or three hours, refer to a physician immediately

v. If a multigravida commences labor with the presenting part above the level of the ischial spines

(a) check previous pregnancy history for size of previous babies and gestational age of previous babies
(b) note the degree of cervical effacement
(c) note the length, strength and frequency of contractions
(d) observe closely until labor has been in the active phase for one or two hours then reassess the mother

(i) if descent has taken place continue with observations
(ii) if no progress has been made refer to a physician immediately

q. Know that ischial spines which are long and pointed can be associated with

i. a long flared shaped pelvis
ii. a narrow pubic arch
iii. a flat sacrum

which could be related to

i. a posterior position
ii. prolonged labor
iii. deep transverse arrest
iv. long second stage
v. perineal and vaginal lacerations

r. Know that the ischial spines which are short and rounded can be associated with

i. a round shallow pelvis
ii. a wide pubic arch
iii. a curved sacrum

which could be related to a normal delivery

(a) Estimate the length and shape of the ischial spines
(b) Feel the shape of the sacrum
(c) Feel the angle of the pubic arch

s. Know that if good spontaneous contractions (every 2-3 minutes lasting 40 seconds) have progressed for 60 minutes with

i. no fetal distress
ii. no descent of the presenting part
iii. increasing edema of the cervix
iv. increasing molding and/or edema of the presenting part

obstructed labor is suspected. Refer immediately to a physician for continuing management

2. Complete the findings of the vaginal examination which would be written to the process of labor

3. Palpate the uterus

a. Know that at the commencement of labor the fundus is at the level of thirty eight weeks gestation

b. Know that the position, presentation, lie and degree of engagement of the presenting part is assessed at the beginning of labor

c. Know that as labor progresses

i. the presenting part cannot be palpated abdominally
ii. the location of the fetal heart descends and becomes more central
iii. the fetus descends, begins to straighten and the uterus becomes less ovoid

(a) Palpate the uterus prior to checking the fetal heart rate
(b) Estimate changes in fetal configuration and calculate any relocation of fetal heart sound
(c) Reduce mother's potential anxiety by rapid location of the fetal heart

III. [illegible] PLAN

A. Principles

1. Perform a clinical

i. on admission
ii. when the patient needs

e. Know that toxemia may cause increasing levels of protein to be produced during labor

1. If protein is present

(a) check patient's record for a history of

(i) kidney disease
(ii) pre-eclamptic toxemia

(b) check patient's admission observations for

(i) blood pressure level
(ii) edema of the hands and face

ii. If toxemia or kidney disease is suspected refer to a physician for continuing management when condition diagnosed

f. Know that acetone in the urine may be a sign of dehydration

i. If acetone is present check if the patient has been having excessive amounts of fluid by

(a) vomiting
(b) diarrhoea
(c) perspiration

ii. Ensure that lossses of fluid are replaced

IV MANAGEMENT OF CARE

A. Observation of progress of labor

1. Differentiate between the stages and phases of labor

a. Know that the first stage of labor lasts from the establishment of true labor contractions until the cervix is fully dilated

b. Know that the first stage is divided into three phases

i. The latent phase (from the commencement of the first stage until the cervix is 3-0 cm. dilated)

ii. The acceleration phase (from 3-0 cm. dilatation until 8-0 cm. dilatation)

iii. The deceleration phase (from 8-0 cm. dilatation until the cervix is fully dilated)

c. Know that the second stage of labor lasts from the full dilation of the cervix until the complete expulsion of the fetus from the birth canal

d. Know that the third stage of labor lasts from the delivery of the fetus to the complete expulsion of the placenta and membranes

e. Know that the mother's behaviour patterns change as she progresses through the stages of labor

f. Know that during the acceleration phase the mother can become

i. restless
ii. uncomfortable
iii. anxious
iv. withdrawn
v. have difficulty coping with the stimuli of the contractions

g. Know that a full bladder may cause

i. increase discomfort
ii. painful uterine contraction

h. Know that loneliness and fear can intensify mother's reaction to contractions

i. Observe the mother for signs of restlessness and problems in coping

ii. Encourage relaxation by

(a) providing companionship
(b) coaching in using breathing exercises
(c) ensuring the maintenance of personal hygiene

iii. Encourage the father to provide his wife with

(a) companionship
(b) breathing coaching

iv. Encourage the mother to void every two or three hours

v. If the mother does not wish to void

(a) palpate the abdomen to check for a distended bladder
(b) if a full bladder is present

(i) encourage the mother to void
(ii) catheterize if all other methods fail

i. Know that during the deceleration phase the mother may

i. grunt towards the end of the contraction
ii. bulge
iii. complain of pressure on the pelvic structures
iv. appear exhausted and unaware of her surroundings
v. observe the mother for signs of expulsive urge

(a) holding breath at the end of a contraction
(b) expulsive grunt
(c) apparent diminished perception of discomfort and increased ability to cope

j. Know that when the cervix is fully dilated fetal descent is more force causing stretching of the vagina and adjoining pelvic musculature and producing an expulsive effort in the mother

i. Place the mother in a position which will enhance the pelvic curve and facilitate the mother's own efforts to expel the baby

ii. Encourage the mother to relax between each contraction

2. Administer medication according to

i. the stage of labor
ii. the rate of progress in labor
iii. the behaviour of the mother

a. Know that as contractions become stronger, longer and more frequent a threshold is reached above which the mother perceives them as painful

b. Know that if the latent phase is excessively prolonged mild sedation to encourage rest and relaxation may subsequently enhance the force of the contraction

i. Prior to administering any medication

(a) assess the progress of labor
(b) estimate the degree of cervical dilatation
(c) check the fetal heart rate
(d) ensure that the bladder is empty

ii. Following administration of a drug

(a) encourage the mother to assume a comfortable position
(b) ensure a peaceful environment
(c) observe the mother's behaviour for signs of a rapid transition through the acceleration phase of labor

3. Administer medication during the first stage of labor which will

i. assist the mother to rest and relax
ii. relieve the discomfort of contractions

a. Know that phenothiazine derivatives (e.g., Sparine, Thorazine, Phenergan)

i. reduce anxiety
ii. suppress nausea and vomiting
iii. enhance the action of narcotics
iv. can cause hypotension

(a) Following administration of a phenothiazine derivative observe the patient for symptom of a sudden drop in blood pressure

(b) If the blood pressure drops suddenly refer to a physician immediately

b. Know that Hyperadrin (Demerol, Pethidine)

i. is a synthetic analgesic
ii. relaxes the smooth muscles of the uterus
iii. has a relaxing effect on the cervix
iv. should produce good relief in approximately 30 minutes from the time of administration
v. if given in the latent phase of labor can lessen the effectiveness of contractions

(a) Do not administer Hyperadrin if the mother is entering the deceleration phase

(b) Observe the mother carefully for rapid progress through the first stage of labor

4. Administer medication in the second stage of labor which will diminish the discomfort of the perineal and pelvic musculature stretching

a. Know that the inhalation analgesic administered to the mother is absorbed into her blood stream and can reach the fetus causing possible newborn respiratory depression

b. Know that nitrous oxide mixed with air (or Oxygen) or trilene analgesia may be self-administered by the mother

c. Know that trilene analgesia has a cumulative effect in the body over time

i. do not allow prolonged use of inhalation analgesia during the second stage

ii. Instruct the mother to inhale the gas only during contractions

iii. Do not use the gas analgesia as an anaesthetic

d. Know that periurethral activity of the gastro-intestinal tract sometimes occurs during labor and vomiting could occur with the administration of a gas analgesic

e. Know that vomiting while under the influence of inhalation analgesia may result in internal aspiration causing

i. pneumonia
ii. asphyxia
iii. death

(a) Before administering gas analgesia check with the mother

(i) the time of her last meal
(ii) the time of her last intake of solid food

(b) If a meal had been taken since labor was established do not give an inhalation analgesia

5. Assistance of a normal delivery

i. Observe the progress of labor and be aware of the adaptive movements of the fetus as they take place

a. Know that as the fetus descends through the pelvis there should be increasing flexion of the fetal head

b. Know that as the flexion increases the contour of the pelvis floor causes the occiput to rotate anteriorly

i. the sagittal suture is in the anterior-posterior diameter
ii. the smallest cephalic diameter (sub-occipito-bregmatic) is presented for delivery

(a) if flexion continues and rotation there may be delay in descent
(b) if the occiput entered the pelvis posteriorly and while rotating anteriorly the vertex becomes fixed by long cephal spines

(i) deep transverse arrest occurs
(ii) progress through the pelvis ceases
(iii) refer patient to a physician immediately

(c) If the presenting part is descending with contractions during the second stage

(i) encourage the mother to push during a contraction
(ii) check the fetal heart rate between contractions
(iii) while progress is encountered and no fetal or maternal distress is observed do not interfere

c. Know that the fetal head is delivered by extension

d. Know that crowning takes place at the time the widest diameters of the fetal skull have passed through the bony outlet of the pelvis

e. Know that rapid expulsion of the fetal head from the birth canal could cause

i. sudden changes in intra-cranial pressure in the fetus which could result in intra-cranial damage

ii. excess trauma to the perineal and vaginal tissues

(a) Where the fetal head can be seen at the vulva, control the speed of expulsion by pressure from the hand

(b) Attempt to deliver the head at the end of a contraction

f. Know that the umbilical cord can be

i. wrapped tightly around the baby's neck
ii. wrapped loosely around the neck and body

g. Know that tension on the cord could result in

i. tearing of the cord from the place of insertion (placenta, baby)

ii. shoulder dystocia (obstruction around the baby's neck resulting in congestion of blood in the baby's head and blockage of the airway if respiratory efforts are made

(a) Immediately following delivery of the head

(i) check for the presence of a loop of umbilical cord around the neck or around the body
(ii) if the umbilical cord is present check to see whether it is loose or tight

(b) If the umbilical cord is loose prepare to delivery the baby through the loop

(c) If the umbilical cord is tight

(i) encourage the mother to pant rapidly in order to prevent her pushing
(ii) clamp the cord
(iii) sever the cord
(iv) unwind the cord from around the baby and proceed with the delivery

h. Know that restitution and external rotation of the fetal head indicate the fetal shoulders are positioned for delivery

i. Know that the anterior shoulder should be delivered first and the posterior shoulder lifted over the perineum. If the mother commences expulsive efforts before the shoulders are in the anterior-posterior position

i. encourage her to pant rapidly
ii. assist the shoulders to rotate to the anterior-posterior
iii. allow mother to push when the shoulders are in the anterior-posterior position

j. Know that in a natural delivery there can be a delay of ten to fifteen minutes from the delivery of the baby to the recommencement of uterine contractions

k. Know that immediately following delivery

i. the uterus is retracted over the placenta
ii. the lips of the cervix hang down into the vagina and may be seen and/or felt

l. Know that with uterine contractions the placenta shears off from the uterine wall and signs of separation occur

(a) the empty fundus rises above the level of the fundus and becomes more visible

(b) there is a small expulsion of blood

(c) the cord (visible outside the vulva) lengthens

i. If the placenta is to be delivered naturally

(a) refrain from

(i) manipulating the fundus
(ii) pulling on the cord
(iii) performing vaginal examination

(b) place a hand over the fundus and observe the mother for signs of

(i) placental separation
(ii) haemorrhage

ii. When signs of placental separation have occurred

(a) encourage the mother to push with a uterine contraction
(b) deliver the placenta and membranes
(c) twist the aftercoming membranes to form a rope to ensure that they remain intact

n. Know that the placenta can be expelled from the uterus

i. by maternal effort
ii. by fundal pressure
iii. by manual removal

o. Know that fundal pressure

i. is only exerted on a well contracted uterus when the placenta is known to have separated

ii. could cause inversion of the uterus if applied on a relaxed uterus

iii. can be combined with cord traction if

(a) the uterus is well contracted and
(b) the placenta in the lower uterine segment and/or the cervix is beginning to contract because of the administration of an oxytocic drug

p. Know that the maternal surface of the placenta is formed of cotyledons and that a succenturiate lobe may be formed of one cotyledon linked to the placenta by blood vessels but surrounded by membranes

q. Know that if portions of the placenta and/or membranes are retained in the uterus following delivery they predispose the mother to

(a) haemorrhage
(b) infection

i. Examine the placenta and membranes following delivery to ensure that

(a) no cotyledons are missing
(b) no blood vessels rupture or leave a bald in the membranes where a succenturiate lobe could have been located

ii. If a portion of the membrane is missing

(a) make a record on the patient's notes
(b) observe vaginal discharge for signs of

(i) expulsion of the tissue
(ii) bleeding
(iii) foul odor

r. Know that a post-partum haemorrhage is a loss of 500 cc of blood within twenty-four hours of delivery and that this loss may occur in less than an hour

s. Know that the manual removal of the placenta is an emergency measure performed when haemorrhage occurs

i. Do not perform a manual removal of placenta as a routine part of a normal delivery

ii. If a patient has a post-partum haemorrhage and

(a) either the placenta has not separated
(b) or a portion of the placenta is retained

(i) notify a physician immediately
(ii) treat the patient in the place where delivery has taken place until physician takes over management
(iii) perform a manual removal of placenta if the physician is not present and the patient's condition is deteriorating
(iv) observe the mother's vital signs and blood loss for signs of deterioration in condition

E. Management of Dystocia from the Genital

1. Perform an episiotomy

a. Know that if

i. there is delay due to the resistance of the pelvic floor muscles
ii. there is tearing due to previous episiotomy repairs
iii. stretching the vaginal perineum could cause a tear
iv. there is diagnosed fetal distress
v. a prophylactic measure is required to prevent subsequent gynaecological problems attributed to the child-birth process

an episiotomy will facilitate delivery

b. Know that an incision from an episiotomy will heal more readily than a tear

c. Know that

i. a first degree tear involves the tissue of the fourchette
ii. a second degree tear involves the muscles of the perineum and the skin of the perineum
iii. a third degree tear involves the muscle of the perineum and the anal sphincter

d. Know that there are two different types of incisions which can be made

i. a midline incision
ii. a medio-lateral, starting at the midline and directed laterad to the ones

e. Know that an incision made lateral to the perineum could result in

i. difficult repair because of the transverse severing of the muscle fibres
ii. damage to Bartholin's gland or its duct
iii. painful healing process for the mother

(a) Allow the mother to push for three or four contractions when the presenting part is extending the vulva

(b) If with good forceful pushes

(i) there is no thinning of the perineum
(ii) no advancement on the presenting part

perform an episiotomy

(c) If scarring prevents the stretching of the perineum enable the perineum to do this that tearing could result from further stretching perform an episiotomy immediately

(d) Ensure that the scissors used for the episiotomy are sharp

(e) If time is available perform a local infiltration of the perineum before doing the episiotomy

(f) If

(i) no time is available
(ii) no local anaesthetic is available

perform the episiotomy at the height of a contraction

f. Know that a midline incision

i. is the easiest to repair because the muscles are divided symmetrically
ii. heals with little scar tissue
iii. is not likely to extend into a third degree tear

g. Know that a third degree tear should not result in serious complications if

i. the patient is placed in a lithotomy position for the repair procedure
ii. a good light is available
iii. the Dennis Purris is adequately removed

2. Manage a post-partum haemorrhage

a. Know that a post-partum haemorrhage can occur

i. when the placenta is or has shown
ii. following delivery of the placenta

b. Know that the following conditions could give rise to a potential risk of haemorrhage

i. multigravity (para 5 and over)
ii. multiple pregnancy
iii. hydramnios
iv. prolonged labor
v. very large baby
vi. ante-partum haemorrhage

and should be referred to a physician for care prior to delivery

c. Know that post-partum haemorrhage can occur

i. when there is failure of the uterus to contract
ii. if there has been a previous ante-partum haemorrhage
iii. when hypofibrinogenaemia is present
iv. when there are retained portions of the placenta
v. if there are vaginal or cervical lacerations
vi. as the pressure of uterine injury or exhaustion

(a) If a post-partum haemorrhage occurs request the presence of a physician immediately

(b) If a haemorrhage commences when the placenta is in the uterus

(i) expell the placenta as rapidly as possible
(ii) use oxytocic drugs to enhance the expulsive action

(c) If a haemorrhage occurs following delivery of the placenta

(i) check the competency of the uterus
(ii) check the vaginal walls and cervix for tears or lacerations
(iii) observe the rate at which blood clots

d. Know that failure of the uterus to contract can be associated with

i. inadequate stimulus of the uterine muscle by the oxytocic hormone from the posterior pituitary gland

ii. overstimulation of the uterus through excessive spasmodic contractions

iii. exhaustion of the uterine muscles

(a) by overstretching
(b) through prolonged use

iv. a full bladder impeding the process

g. Know that a uterus can be stimulated to contract by

i. firm massage of the fundus of the uterus
ii. compression of the uterus between the hands

(a) a fist placed in the anterior fornix
(b) the other hand applying pressure to the fundus

iii. use of oxytocic drugs to cause uterine contractions

h. Know that once compression is commenced it must be maintained until an alternative treatment is started

i. Know that oxytocic drugs

i. of ergot derivative produce long strong contractions of the uterus

(a) can cause hypertension in a patient with toxemia
(b) can cause the uterus to clamp on a placenta before it is expelled

ii. of pituitary derivation produce rhythmic contractions
iii. stimulate the uterine muscle to contract around bleeding points and reduce hemorrhage

(a) if the uterus is not contracting

(i) massage the fundus of the uterus with a firm stroking motion to stimulate the uterine muscle to contract
(ii) administer an oxytocic drug to stimulate contraction
(iii) ensure that the bladder is empty

(b) if all other methods prove unsuccessful apply bimanual compression until the physician arrives

(c) When the uterus becomes contracted

(i) refrain from continuing overstimulation
(ii) continue to observe the uterine tone

and check for signs of further bleeding

(d) Take the mother's vital signs (blood pressure, pulse)

(i) at regular five to ten minute intervals
(ii) but do not allow monitoring to take precedence over remedial measures

6. Infant Care

1. Supervise the establishment of respiration

a. Know that the newborn's spontaneous respiratory effort could be exhibited in choking as the nose and mouth

b. Know that the establishment of respiration is the most critical factor in the first minute of life

c. Know that mechanical instruments for sustaining the newborn's air can could cause damage to the mucous lining of the respiratory tract

i. if the head is delivered at the end of a contraction wipe the nose and mouth before delivering the rest of the body

ii. Remove excessive mucous prior to the initiation of the first breath

(a) manually (finger covered by swab)
(b) oral suction
(c) electrical suction

iii. Do not suction

(a) directly against the mucous lining of the respiratory tract
(b) when the infant is being contacted and the newborn is crying normally

iv. Observe whether the effort to breathe is

(a) shallow
(b) slow and irregular
(c) accompanying a good cry

d. Know that the longer it takes for respiration to commence after delivery

i. the infant is having increasing oxygen deprivation
ii. there is a greater risk of brain damage to the newborn

e. Know that low levels of oxygen can be absorbed through the mucous membrane lining the respiratory tract

i. If no respiratory effort is present in thirty seconds from birth

(a) place the infant on a flat surface
(b) ensure that the airway is clear of mucus
(c) administer oxygen by mask
(d) request the presence of a physician within three minutes

ii. If no physician arrives and if no respiratory effort is present in two minutes from birth commence mouth to mouth resuscitation

f. Know that high pressures of gases entering the newborn's lungs could rupture the alveoli sacs

2. Observe the newborn's adjustment to life

a. Know that in the first minute of life normal newborn's should have a heart rate about 100 beats per minute

i. should be making respiratory efforts and crying
ii. should have good muscle tone and be active and moving
iii. should produce a response sign if reasonably stimulated
iv. should be predominately pink in color

b. Know that the above list could count as upon score of 10 with two points being given for each criteria

c. Know that an Apgar score of 7 would be given to each of the following criteria

i. a heart rate below 100
ii. a slow, irregular respiratory effort
iii. minimal muscle tone and some flexion of the extremities
iv. well are of extremely circumstance
v. the body is pink while the extremities are blue

d. Know that an Apgar score of 0 would be given to each of the following criteria

i. the heart beat is absent
ii. respiratory effort is absent
iii. muscle tone is flaccid
iv. no reflex responses
v. color is pale blue or gray

e. Observe the newborn at one minute and at five minutes of life and calculate the Apgar score

f. Know that an Apgar score of

i. three and less, the newborn is severely depressed
ii. between four and seven the newborn is moderately depressed
iii. above seven the newborn is satisfactory

g. Know that a decrease of the Apgar score between 1 minute and 5 minutes could indicate an accumulation of lactic acid in the newborn with resulting metabolic acidosis

h. Know that an increase in lactic acid can be caused by

i. rapid shifting of the newborn following delivery and/or
ii. decreased oxygen levels in the arterial blood at the time of delivery

i. Know that an infant with a low Apgar score would be delivered by the mother

i. who has been designated as the high risk category and/or
ii. who has had a labor which caused fetal or maternal distress

(a) If a low Apgar score or expected prior to a delivery

(i) have equipment available for resuscitation
(ii) refer patient to a physician prior to delivery

(b) Ensure that every newborn is kept in a warm environment following delivery

V. PATIENT TEACHING

1. Reinforce previous teaching during labor and delivery

a. Know that when the patient is using all her physical and psychological resources to cope with labor and delivery

i. she will need reinforcing of past knowledge and skills
ii. she will have difficulty absorbing new knowledge

b. Know that the patient will respond more positively to a home where that is a strategy aware

i. encourage the husband to support in reinforcing previous teaching
ii. Allow coaching partners establishing during the pre-natal period to be continued

2. Explain the procedures and processes of labor and delivery as they occur

a. Know that every labor is different from any other

b. Know that change in the progress of labor and delivery (especially if unexpected) could cause anxiety and tension

c. Know

i. that fear can precipitate tension
ii. that tension can produce an increased perception of pain and discomfort
iii. that pain and discomfort can create an increase in fear or anxiety

(a) Be honest with the mother in explaining the probable time that delivery will take place

(b) If a situation occurs which requires increased monitoring of the mother and/or the fetus explain the procedure to be followed and explain the advantages

(c) Offer explanations to relinquishes as often as to patient-provides

3. Know the mother her baby

a. Know that the process of mother-baby interaction follows a series of steps

i. visual contact
ii. digital contact and stroking
iii. hand contact and grasping
iv. holding and exploring

b. Know that the various of steps may be passed through

i. within a few minutes
ii. within a couple of hours
iii. over a period of days

c. Know that every mother does not require "mother-love" at the first sight of their newborn

i. Give the mother the opportunity to see her baby as soon as possible after delivery

ii. Allow the mother to set the pace at which she will interact with her baby

iii. If the mother does not wish to interact with her baby

(a) do not pressure her into holding her baby
(b) do not make her feel guilty by imposing her own "good mothers"

iv. Give the mother the time to explore her baby at she wishes to

4. Encourage family participation

a. Know that the father goes through a similar process to the mother as he interacts with the baby

b. Know that a mutual experience can be a stimulus force the husband and wife

- If possible allow the husband and wife to interact with the baby

(a) together
(b) as soon after delivery as possible.

c. Know that the baby's color and reflex activity can be alarming to inexperienced parents

i. explain the normalcy of the baby's appearance
ii. allude to stimulus times pre-natally where this experience was discussed

[illegible]

[illegible]

[illegible]

I. [illegible]

Plan initial newborn care on the basis of ante-natal and intra-partum history

a. Know that a newborn placed in a high risk category because of ante-natal complications should receive continuing supervision by a physician

b. Know that a newborn who

i. had a traumatic delivery
ii. had an Apgar score of seven or less
iii. was categorized as premature
iv. has congenital anomalies

should receive continuing supervision by a physician

c. Know that a newborn who

i. was delivered normally
ii. had an initial Apgar score greater than seven
iii. is a full-term and healthy baby

would not be expected to deviate from the normal in the post-partum period

(a) Review all maternal and infant records
(b) Take responsibility for supervision and management on an uncomplicated situation

II. [illegible]

A. First examination after birth

1. Observe the posture assumed by the infant

a. Know that the full-term normal infant lies

i. with limbs flexed
ii. head rotated to one side
iii. head tightly extended

b. Know that flaccidity of limbs can be associated with

i. neuromuscular disorder
ii. respiratory distress
iii. prematurity
iv. a fractured limb

(a) Make the initial observation when the baby is lying quiet
(b) If signs of flaccidity are observed

(i) complete the initial examination
(ii) refer the infant to a physician immediately

2. Elicit a there reflex

a. Know that the there reflex is an abduction and extension of the arms with hands open and a sudden movement of the legs

b. Know that the there reflex can be elicited by a loud noise or sudden movement.

i. Show a flat object near the baby a short hang when the newborn is lying quietly and watch the response pattern.

ii. If no there response is observed initially repeat the procedure and if the response remains negative report the findings to a physician within twelve hours.

3. Observe the newborns respirations

a. Know that the newborns breathing is usually diaphragmatic and irregular in depth and rhythm

b. Know that the normal rate of respirations in a newborn is 30-60 per minute

c. Know that abnormal respiratory patterns can be associated with

i. obstruction of the airway
ii. idiopathic respiratory distress syndrome
iii. diaphragmatic hernias
iv. congenital abnormality of the heart

(a) Observe the newborn when lying quietly
(b) If the infants respiratory pattern includes

(i) sternal retraction
(ii) expiratory grunts
(iii) flaring nostrils
(iv) intercostal indrawing
(v) respirations greater than sixty per minute

refer the newborn to a physician immediately

d. Know that mucous may block the newborns airway

i. Place the newborn on his side to allow for drainage of the mucous by gravity

ii. If the mucous flows too freely for gravity drainage to be adequate

(a) use mechanical suction to remove the mucous
(b) observe every fifteen minutes for continuing mucous drainage

e. Know that excessive mucous may indicate an esophageal atresia

i. If the newborn requires regular assistance to drain mucous during a three to four hour period

ii. refer the infant to a physician immediately

iii. refrain from commencing feeding.

4. Examine the newborn head

a. Note the shape of the head

i. Know that molding following a normal vertex delivery causes elongation of the fetal skull in the oblique diameter (anterior to posterior fontanelle)

ii. Know that abnormal molding of the fetal skull may result in intracranial damage

iii. Know that signs of intracranial damage are

(a) high pitched cry
(b) irritability to sensory stimulation
(c) rigid muscle tone
(d) vomiting
(e) neck retraction

(f) If there is abnormal molding observe the newborn closely for the first 24 hours of life for signs of intracranial damage

(g) If intracranial damage is suspected refer the infant to a physician immediately

b. Measure the head circumference

i. Know that the initial measurement of the circumference will form a base line for subsequent measures. If there is an enlargement of the newborns head circumference in the first three to four days of life, suspect

(a) hydrocephalus
(b) a subdural hematoma

and refer the infant to a physician immediately

c. Palpate the fetal head

i. Know that a caput succedaneum

(a) feels soft and boggy and
(b) will pit on pressure, and
(c) ties over the sutures and
(d) should completely disappear within two or three days of birth

ii. Know that a cephal hematoma

(a) is an accumulation of blood between the skull bone and the periosteum
(b) does not extend over the suture lines or fontanelles
(c) becomes noticeable 3-6 hours after birth
(d) may take 6-8 weeks or longer for the blood to be reabsorbed

iii. If there is a "lump" on the newborns head differentiate between a caput succedaneum and a cephal hematoma

iv. Explain to the mother that

(a) the "lump" has no effect on the newborns brain
(b) in time the "lump" will disappear

v. Know that a depressed fontanelle may indicate dehydration

vi. Know that dehydration is associated with loss of blood fluid by

(a) vomiting
(b) diarrhoea
(c) increase in environmental temperature

- If a fontanelle is depressed

(i) take the infant's temperature
(ii) observe the respiratory rate
(iii) note any record of vomiting and/or
(iv) diarrhoea

and refer to a physician immediately

vii. Know that a bulging anterior fontanelle indicates intracranial pressure and could be associated with

(a) intracranial hemorrhage
(b) hydrocephalus

- If an anterior fontanelle is bulging refer the infant to a physician immediately

5. Observe the facial appearance

a. Know that Down's syndrome (Mongolism) is associated with

i. small head
ii. broad nose
iii. eyes that slope upward
iv. flattened occipital region
v. short upper lip
vi. large tongue
vii. hands with short tapering fingers and a little finger curved inward and one deep palmar crease
viii. poorly developed sole creases except for the deep crease between the big and second toe

(a) If the newborn's facial characteristics oppose Mongoloid

(i) observe the infants response to feeding
(ii) check creases on hands or soles and refer to a physician during the first week of life

(b) If the mother suspects that her baby is "different" permit her to verbalize the signs she has noticed

b. Know that a cleft palate may occur with or without an associated cleft lip

i. Observe the palate of each infant while crying

ii. If a cleft palate is observed refer the infant to a physician within 24 hours

iii. If a cleft palate is suspected, insert a gloved finger into the baby's mouth and feel for any break in the continuum of the hard or soft palate

c. Know that a newborn will turn his head in the direction of the stimuli when his cheek is touched demonstrating the rooting reflex

- If the rooting reflex is not elicited the baby may

(a) be depressed from delivery
(b) and have difficulty in finding the mother's nipple if being breast fed

6. Observe the newborns eyes

a. Know that subconjunctival hemorrhage can be caused by rupture of capillaries during the birth process

i. If the mother displays concern about the blood spots in the infants eye(s) explain that

(a) the spots will disappear within two weeks
(b) there is no damage to the baby's eyes

b. Know that silver nitrate solution can be instilled into the newborn's eyes (following delivery) as a prophylaxis against gonorrheal ophthalmia

c. Know that chemical conjunctivitis can result from the use of silver nitrate solution as an eye instillation

d. Know that symptoms of chemical conjunctivitis occur within two hour of silver nitrate solution administration and are

i. edema of the eyelids
ii. purulent discharge

7. Observe the newborn abdomen
   a. Know that the abdomen should be
      i. cylindrical
      ii. slightly prominent
      iii. soft to gentle palpation
   b. Know that signs of abdominal distention are
      i. rounded abdomen
      ii. tense and hard to palpate
   c. Know that fullness in the suprapubic area may indicate an enlarged bladder which may be due to obstruction of the urethra
      i. Gently palpate the newborn abdomen and check for
         (a) abdominal distention
         (b) enlarged bladder
         and if detected refer the baby to a physician immediately
      ii. If urine is only passed in a dribble or no voiding takes place in the first 24 hours of life, suspect an obstruction of the urethra and refer infant to a physician immediately
8. Observe the genitalia
   a. Know that within the folds of the labia of a female infant the following may be observed
      i. smegma
      ii. a tinged vaginal discharge
      iii. a blood tinged vaginal discharge (pseudomenstruation)
   b. Know that vaginal discharge in a female newborn is a physiological demonstration of maternal hormone transfer which is harmless to the infant
      i. Reward any sign of vaginal discharge
      ii. Explain the harmless of the occurrence of pseudomenstruation to a female infant to a mother who is alarmed at blood tinging a diaper
   c. Know that the testicles should be in the scrotum of a full-term male infant
   d. Know that if the testicles remain in the inguinal canal (cryptorchidism) descent may occur within two months of birth without treatment
      i. If the testicles have not descended into the scrotum refer infant to a physician within one week
      ii. Assure the mother that delay in descent of the testicles is
         (a) a fairly common occurrence
         (b) has no effect on the successful development of the infant
   e. Know that malformation of the penis (e.g., hypospadias) could cause difficulty in voiding
9. Examine the infant's limbs
   a. Know that a flaccid forearm and permanent wrist suggest Erb's paralysis
   b. Know that Erb's paralysis is caused by injury to the brachial plexus
   c. Know that lack of early treatment for Erb's paralysis will result in permanent paralysis
      i. Observe the movement of the infant's arm
         (a) when sleeping
         (b) when active and crying
      ii. If Erb's paralysis is suspected refer to a physician immediately
   d. Know that a test for congenital dislocation of the hip joint is to
      i. grasp the infants knees and bend the knees toward the chest and spread the knees apart and apply pressure so that they lie flat on either side of the body
      ii. This will cause flexion and abduction of the hip joint
   e. Know that if the infant's knee will not lie flat the head of the femur can be overriding the acetabulum
      - If the infant's knees will not lie flat on either side of the body suspect the presence of a congenitally dislocated hip joint and refer the infant to a physician within a week
   f. Know that a test for talipes is to place the thumb under the posterior half of the infant's foot and press the foot upward toward the anterior aspect of the tibia (dorsiflexion)
   g. Know that if there is resistance to the dorsiflexion of the foot talipes may be suspected
      - If talipes is suspected refer to a physician within 24 hours
10. Examine the infant's back
   a. Know that if placed prone the newborn should
      i. flex the thighs
      ii. elevate the buttocks
      iii. turn its head to one side
   b. Know that a spina bifida may be covered by skin and give the appearance of a dimple
   c. Know that a sinus in the sacrococcygeal region may communicate with cerebro spinal fluid in the meninges and this could result in meningitis
      i. Run a finger down the length of the spinal column and note any curvature of the baby curvature
      ii. Part the buttock and examine the lower spinal column for a sinus
      iii. If a spina bifida or a pilonidal sinus are suspected refer the infant to a physician immediately
11. Observe the skin
   a. Know that numerous papules over the bridge of the nose and chin are caused by overdistended sebaceous glands and tend to disappear spontaneously
      - If the mother asks about the papules explain that they are a temporary phenomena
   b. Know that vernix caseosa will adhere to the skin of the newborn foreadominantly in the creases and folds of the skin
   c. Know that vernix caseosa will be shed spontaneously within two to three days of birth
      i. Rub the skin gently to remove excess vernix caseosa
      ii. Do not attempt to remove all vernix caseosa by rubbing the skin vigorously
   d. Know that stork bank marks
      i. are blamed on pressure
      ii. become more noticeable during periods of crying
      iii. tend to disappear by the end of the first year
      - Point out the stork bank marks to the mother and explain that they are a temporary phenomena
12. Regular Monitoring
   1. Weighing the infant
      a. Know that 70-75% of body weight is water
      b. Know that the infant loses 10% of his birth weight during the first two-three days of life
      c. Know that a large infant (9 lbs. and over) may lose a greater proportion of birth weight (12-13%)
      d. Know that if weight loss exceeds 15% of birth weight symptoms of inanition fever could appear
      e. Know that if inanition fever is present the infant's temperature could reach 103° - 104°F (40.5° - 41.5°C)
      f. Know that the infant's weight loss should be stabilized by the fifth day
      g. Know that birth weight should be regained by the tenth day
         i. Weigh the newborn naked and carefully record the birth weight
         ii. If the proportion of weight loss exceeds 10%
            (a) ensure the infant has all the fluid intake he will tolerate
            (b) and check the infant's temperature every twelve hours
         iii. If inanition fever is suspected refer to a physician immediately
         iv. If weight loss is associated with feeding problems refer to a physician within 24 hours
   2. Take and record the infant's temperature
      i. following delivery
      ii. hourly until stabilized
      iii. daily until direct supervision ceases
      a. Know that the full term infant increases his rate of metabolism upon exposure to cold
      b. Know that metabolic rates can be changed by adjusting the environmental temperature
      c. Know that internal heat regulation by the infant begins at or after one week of life
      d. Know that at birth the infant's temperature drops approximately 3°C (5°C) in the first hour of life
      e. Know that the newborn has inadequate sweating mechanism and an immature heat regulating centre and therefore hyperthermia could result from overheating
         i. Take the newborn's temperature with a thermometer capable of recording temperatures lower than 96°F (36°C)
         ii. If the infant's temperature is recorded at less than 97°F (36.5°C)
            (a) increase the environmental temperature
            (b) monitor the infant's temperature hourly until it exceeds the critical level
         iii. If the infant's temperature is recorded as equal or more than 98°F (36.5°C) adjust the environmental temperature to reduce the infant's temperature below the critical level
      f. Know that anal atresia can be suspected if a rectal thermometer cannot be inserted into the rectum
         i. Check the rectal temperature with a rectal thermometer
         ii. If anal atresia is suspected refer to a physician immediately
   3. Observe the infant's color
      a. Know that the infant should be pink
      b. Know that cyanosis (Apgar 2) can be caused by inadequate oxygen supplies and could be associated with
         i. respiratory distress or
         ii. intracranial haemorrhage
         iii. cardiac anomalies
      c. Know that circumoral pallor can be associated with
         i. cardiac anomalies and/or
         ii. accumulation of gas in the stomach
         - If cyanosis is present
            (a) observe respirations and
            (b) listen to the pattern of crying
            (c) note when the cyanosis is most prominent
            (d) refer to a physician immediately and report findings
      d. Know that indirect bilirubin accumulates in the tissues and causes clinical jaundice
      e. Know that jaundice appearing less than 24 hours from the time of birth is probably due to blood incompatibility
         - If blood incompatibility is suspected refer the infant to a physician immediately
      f. Know that an infant with clinical jaundice appearing on or after 24 hours from birth can have pathological jaundice
      g. Know that physiological jaundice occurs if the liver is unable to excrete sufficient glucuronyl to change unstable bilirubin into a soluble form
      h. Know that physiological jaundice can cause the infant to be listless and show lack of interest in feeding
   4. Observe the infant's stools
      a. Know that meconium is the first stool that the newborn passes and this occurs in the 24 hours following birth
      b. Know that meconium is sticky, greenish-black, odourless
         - If meconium is not passed in the first 24 hours refer the infant to a physician immediately
      c. Know that as milk is digested the meconium stool changes to a transitional stool which is greenish-brown and soft

4. [illegible] that by the fourth day after birth the stool becomes paler in color

   i. If the change in the transitional stool has not taken place by the second day

      (a) check the amount of milk taken by the baby
      (b) observe the baby for the next 24 hours for signs of poor digestion of milk (e.g., vomiting)

   ii. If, on the third day when final results has been entered, and no change in stool has taken place refer the infant to the physician immediately.

5. [illegible] that the number of stools passed in a day is affected by

   i. the amount of milk taken
   ii. whether the feeding is artificial or breast
   iii. the muscle-tone of the gastro-intestinal tract

6. [illegible] that clay colored stool can indicate abnormalities of the bile duct

7. [illegible] that stools containing a large amount of mucus can be caused by irritation of the intestine

8. [illegible] that tarry stools may be a result of poisoned blood swallowed during passage through the birth canal or bleeding from the intestinal tract

   i. If the newborn's stools are

      (a) clay colored
      (b) normal
      (c) tarry

      refer to a physician immediately

   ii. If the newborn's stool is tarry, obtain a specimen of stool for laboratory testing

9. [illegible] that a diarrheaed stool is

   i. green
   ii. liquid
   iii. frothy

10. [illegible] that diarrheas may be caused by

   i. overfeeding
   ii. too rapid filling of the infant's stomach
   iii. objections to changes in type of milk taken
   iv. allergies to proteins in cow's milk
   v. infections

11. [illegible] that an infant with diarrhea can become seriously ill within four to six hours and exhibit signs of

   i. fluid and electrolyte imbalance
   ii. dehydration
   iii. acidosis

      - If an infant has diarrhea refer infant to a physician immediately and report changes in feeding patterns and/or apparent allergens which could assist in a differential diagnosis.

[illegible]

[illegible]

1. [illegible]
   1. Base the plan for postpartal care upon the history of
      i. past pregnancies
      ii. present pregnancy
      iii. labor and delivery
      iv. medical and obstetrical complications
   2. Know that the postpartum extends from the end of the third stage of labor to six weeks from delivery
   3. Know that any deviation from the normal which has required ongoing supervision by a physician prior to delivery, may persist or recur following delivery
   4. Know that deviations from the normal which were associated with past pregnancies and deliveries may occur and/or may affect potential behavior during the post partum period
   5. a. Review all records of the care the mother has received up to the beginning of the post-partum period
      b. Help take responsibility for supervision and management in an unsophisticated situation
      c. If there was a deviation from the normal in a past pregnancy
         (1) check the present history to ascertain the probability of recurrence
         (2) explain to the parents these aspects about the past experiences which may occur

II. [illegible]
   A. [illegible]
      1. Palpate the abdomen to assess
         a. uterine consistency
         b. uterine consistency
      2. Know that immediately after delivery the fundus of the uterus is
         a. a few inches down
         b. in the midline of the abdomen
         c. at the level of the umbilicus
      3. Know that a poorly contracted uterus in the first 24 hours following delivery may indicate
         a. retained products
         b. blood clots
         c. a full bladder
      4. Know that a full bladder may cause the uterus to rise in the abdomen
         a. Palpate the uterus to detect signs of relaxation
            (a) every five to ten minutes for the first 1/2 hour following delivery
            (b) every half hour for the next three hours
         b. After 12 hours from delivery check the consistency of the uterus with less frequency based upon the evidence of
            (a) the maintenance of a firm uterus consistency
            (b) the ability of the mother to rest.
      5. Know that following delivery the sensory nerves from the bladder may be less responsive and the perception of the need to void diminished
      6. Know that a mother may fear to void following delivery due to discomfort from perineal trauma and/or misunderstanding as a strange a instinct
         a. If the uterus has risen above the level of the umbilicus and is filled to the brim check whether the mother has voided since delivery
         b. If the mother has not voided since delivery
            (1) encourage her to attempt to void even if she says she can feel like it
            (2) ensure her that perineal discomfort may be relieved by voiding
            (3) ensure that the mother has maximum privacy
      7. Know that a poorly contracted uterus may precipitate a post-partum hemorrhage
         a. If the uterus rises above the umbilicus, is on the midline and feels soft in consistency
            (1) massage the fundus to stimulate a contraction
            (2) and apply gentle fundal pressure to the contracted uterus
            (3) express blood clots which may have formed in the uterus
            (4) record the estimated quantity of blood lost in the clots
         b. If the uterus continues to soften and form blood clots
            (1) check the records of the delivery for a history of suspected retained portion of placenta and/or membranes
            (2) and if record indicates retained products suspected refer to a physician immediately
         c. If the uterus does not remain contracted
            (1) check the records for the time lapse since the last administration of an oxytocic drug
            (2) if no drug had been administered in the previous four hours
            (3) or if an oxytocic drug had been administered since delivery
               (a) confirm that the patient is not hypertensive
               (b) confirm there is no allergic contraindication
            (4) administer an oxytocic drug
      8. Know that during the postpartum uterine muscle tissue returns to the prepregnant state
      9. Know that the rate of involution is
         a. more rapid in a primigravida and/or a breast-feeding mother
         b. slowed in the presence of retained products and/or uterine infection
      10. Know that excessive relaxation of the rate of involution can be prevented by a full bladder
      11. Know that signs of infection of the uterine lining are
         a. pyrexia
         b. uterine tenderness
         c. purulent vaginal discharge
            (1) Before palpating the fundus to assess involution ensure that the mother has recently voided
            (2) Palpate the uterus once daily until it has descended into the pelvis
            (3) Calculate the rate of descent with reference to the umbilicus as a guideline
            (4) If not involuting ensure
               (a) observe the mother during the palpation for the indication of a perception of pain
               (b) if signs of tenderness are detected suggest the permanent of alternate reflection
                  - check vital signs for fever
                  - check vaginal discharge for purulent odor and appearance
                  - refer the mother to a physician within the next six hours
      12. Know that the fundus of the uterus is not palpable above the level of the symphysis pubis at two weeks post-partum
      13. Know that the spasmodic contraction of the uterus following delivery is more prevalent in
         a. multigravida patients
         b. mothers who are breast-feeding their infants
         c. mothers within one hour of being administered an oxytocic drug
            (1) If a multigravida is aware of "after-pains" and/or a mother who has received an oxytocic drug
               (a) check that the bladder is empty
               (b) administer a mild analgesic
               (c) encourage to relax and rest in a comfortable position
            (2) If a mother complains of "after-pains" while breast-feeding her baby do not give an analgesic prior to feeding as a prophylactic measure but administer a mild analgesic following feeding if the discomfort remains
      14. Know that disorders of the aorta sometimes can be associated with
         a. polyhydramnios
         b. multiple births
         c. a very large baby
         d. grand multiparity
            (1) Encourage the mother to perform simple alternating tension and relaxation exercises which would assist in
               (a) toning skeletal muscles
               (b) improving physique
               (c) correcting posture altered during pregnancy
            (2) Suggest that exercise exercises can be as effective as resident parts and less traumatic to unstressed muscles and ligament tissue

   B. Observe vaginal discharge
      1. Know that following delivery the vaginal discharge is called lochia and has a fleshy odor
      2. Know that lochia rubra persists for two to three days following delivery, is red in color and consists of fragments of endometrium
      3. Know that lochia serosa persists from the third to the tenth day post partum, is brown or pink in color
      4. Know that lochia alba is white, consists mainly of mucus, and decreases in quantity from the tenth day to three to four weeks post-partum
         a. If a red loss persists for longer than three days and/or returns after the lochia has become brownish
            (1) suspect retention of placental fragments
            (2) observe closely for signs of hemorrhage
         b. If the accumulated amount of lochia rubra within a span of twelve hours approaches 500 c.c. refer to a physician immediately
         c. If lochia becomes offensive in odor
            (1) suspect uterine infection
            (2) refer to a physician within the next six hours
      5. Know that the stimulation of the posterior pituitary to produce oxytocin in the mother breast feeds her baby, causes the uterus to contract and may increase the amount of lochia draining
         If the mother is breast feeding her baby, explain that the flow of lochia may increase during the baby's feeding and will return to normal as soon as the baby stops sucking
   C. Inspect the perineum
      1. Know that a normal perineum
         a. should heal within seven days
         b. can be associated with
            (1) pain and/or discomfort to the mother
            (2) edema of the surrounding tissues
            (3) hematoma
      2. Know that it takes six to eight weeks to restore muscle tone to the pelvic floor stretched during parturition
      3. Know that to reduce the risk of perineal infection and enhance the speed of healing, perineal hygiene should consist of
         a. keeping the area clean and dry
         b. cleaning and drying from the least contaminated area to the most contaminated
            (1) if perineal tissue breaks down following suturing refer mother to a physician immediately
            (2) if the mother is suffering extreme pain and discomfort in the perineal and rectal area within 24 hours of delivery
               (a) suspect a retro-vaginal hematoma
               (b) check maternal vital signs
               (c) refer mother to a physician immediately
      4. Know that dry or wet heat can be applied to the perineal area to invest in relieving discomfort

a. If a personal has been noticed about the mother
   i. to avoid standing for long stretches of time
   ii. on the principles of personal hygiene, and
   iii. how to sit to avoid pulling on sutures
   iv. that overexposure (20 minutes and more) to either dry or wet heat could result in iatrogenic disorders

4. Inspect the breasts

a. Know that following delivery there will be a stasis of venous and lymph flow in the breasts as lactogenesis takes place which can result in engorgement

b. Know that breast engorgement is identified by
   i. tense hard breast tissue
   ii. maternal complaints of an aching painful sensation

c. Know that engorgement occurs
   i. about the second day in a primigravida
   ii. about the third day in a multigravida
   - and lasts 24-36 hours

d. Know that engorgement may be inhibited in the mother who is not breast feeding by breast support and cold compresses

e. Know that engorgement may be inhibited in the mother who is breast feeding by the establishment of the feeding regime within eight hours of delivery

f. Know that during the period of engorgement the baby who is breast feeding may have difficulty grasping the mother's nipples
   i. If engorgement takes place
      (a) assure the mother that it is not due to overheatation with milk
      (b) check that the breasts are well supported and not constricted
      (c) if the mother is not breast feeding administer a mild analgesic medication
      (d) apply cold compresses
   ii. If the baby has difficulty grasping the nipple because of engorgement, pull out the nipple for the baby to suck by using
      (a) a breast shield
      (b) manual expression

5. Inspect the nipples of the breast feeding mother

a. Know that pathological organisms can enter the breast through fissured nipples and could cause mastitus and/or breast abcess

b. Know that signs of breast infection are
   i. localized reddening and warmth
   ii. and tenderness
   iii. and signs of systemic infection
      (a) If the mother's nipples are red and sore
         (i) keep the nipples dry
         (ii) apply topical cream (after feeding) to help the nipples lubricated
         (iii) do not allow the baby to feed for long periods of time
      (b) If the mother's nipple is cracked
         (i) rest the nipple for one or two feedings while hand expressing the milk
         (ii) and expose the nipple to dry heat for fifteen minutes after each feeding

c. Know that to obtain milk from the breast the baby's
   i. mouth must completely cover the primary areola
   ii. gums must press on the lactiferous ducts
   iii. tongue must be under the nipple

d. Know that if a baby is malpositioned for sucking with the nipple could be shaped causing trauma and fissures

e. Know that if a baby sucks vigorously at an empty breast the nipple could become cracked

f. Know that the length of the mother's nipples affects the time limits of the feeding periods during the first 48 hours

g. Know that the baby's jaw can be pulled down to release the vacuum caused by sucking and prevent pulling on the nipple
   i. Stay with the mother during the first two-three feedings to ensure
      (a) the baby does not suck for longer than two minutes at each breast
      (b) the baby's mouth is appropriately positioned
      (c) the baby releases the nipple with minimal trauma to the mother's tissues
   ii. Instruct the mother to wash her breasts after feeding and to wipe her nipples before feeding
      (a) to remove stale milk
      (b) to prevent the formation of crusts

6. Vital Signs

1. Take the mother's temperature

a. Know that the temperature should remain within the normal range during the puerperium
   i. Take the mother's temperature daily
   ii. Unless pyrexia (98°F, 36.5°C) indicates the need for more frequent observation

b. Know that pyrexia, occurring more than 24 hours after delivery may indicate infection

c. Know that the site and cause of infection in the post-partum period could be
   i. breasts
   ii. respiratory disease
   iii. urinary infection
   iv. thrombophlebitis
   v. endometritis
      (a) If the temperature is elevated to 100.4°F (38.5°C) and above on two days during the first ten days following delivery, notify a physician immediately
      (b) Instruct the mother to detect any deviation from the normal which will assist in localizing the site and possible cause of infection

2. Take the mother's pulse, blood pressure and respiration

a. Know that the pulse rate may fluctuate during the puerperium

b. Know that the blood pressure may rise slightly immediately following delivery and will be stabilized at the normal level within one hour of delivery

c. Know that a patient whose blood pressure has been rising gradually during labor may exhibit signs of eclampsia following delivery

d. Know that respirations are not normally altered during the puerperium
   i. Check the pulse and respiratory rate if the temperature is elevated
   ii. If symptoms of eclampsia are exhibited refer to a physician immediately

III. MANAGEMENT OF CARE

A. During the puerperium

1. Provide psychological support

a. Know that "post-partum blues" can be caused by anxiety generated through
   i. increasing stress and tension associated with anticipation of the maternal role
   ii. sharing the centre of attention with the newborn
   iii. conflict between the pleasure of feeding needed and distrusted or arousing new responsibilities
   iv. restriction of personal freedom
   v. conflicting opinions of friends, relatives and professional attendants

b. Know that emotional instability is associated with puerperal physiology

c. Know that symptoms associated with puerperal psychosis are
   i. insomnia
   ii. depression
   iii. loss of interest
   iv. wide mood swings
      (a) If the mother wants to talk and verbalize her feelings, be a good listener
      (b) If a mother wishes to remain quiet and not communicate give non-verbal support by
         (i) accepting her behaviour without attempting to change it
         (ii) being oneself available when stress situations could occur (e.g., baby feeding or bathing)
         (iii) responding to obvious distress (e.g., crying) by
         - holding her hand or shoulders
         - offering tissues
         - providing water to wash her face
      (c) If puerperal psychosis is suspected refer the patient to a physician immediately

2. Supervise the establishment of infant feeding

a. Know that the average nutritional requirement of the normal newborn at 10 days to 2-1/2 oz. (75 ml.) of breast milk (= 20 calories) per pound (0.45 kg.) of body weight

b. Know that the infant's fluid requirements are calculated on the basis of 30 calories per ounce (35 ml.) of fluid

c. Know that nutritional intake should be such that weight gain averages 5-8 oz. per week
   i. Calculate the amount of fluid and nutritional intake an infant needs at 10 days of life
   ii. Increase the feedings during the first 10 days until they reach the calculated level

d. Know that a warm environment or fever could cause alteration in the infant's fluid balance
   - If the infant is febrile and/or the environment is warm give supplementary feedings of water

3. Supervise the preparation for breast feeding

a. Know that a constricting brassiere interferes with the free circulation of fluid to and from the breast
   - Check that the brassiere
      (a) supports the breasts in the cups
      (b) directs the breasts to the midline
      (c) does not compress the breasts against the chest wall

b. Know that during lactation the mother should maintain a nutritionally balanced diet with an intake between 2,500 - 3,000 calories per day
   i. Assure the mother that she may eat anything (in moderation) that agrees with her without it affecting the baby
   ii. Advise the mother to observe the baby for diarrhoea or gastric upset each time she introduces a new food or drink into her diet

c. Know that the milk ejection (let-down) reflex is a conditioned response to
   i. the infant feeding
   ii. the mother hearing her baby cry
   iii. the mother thinking of the baby or feeling that even though they are apart
   iv. sensory contact between the mother and baby

d. Know that the milk ejection reflex is inhibited by
   i. tension and/or
   ii. stress
      - prepare the mother for those factors which produce the milk ejection response (section c, above)
   iii. if a mother is tense and worried
      (a) encourage her to express her feelings between feedings
      (b) take care she is comfortably positioned to feed her baby
      (c) ensure the environment is peaceful and relaxing

(d) make sure the baby is ready to be fed and
(e) is not sleepy
(f) has not reached a point of frustrated hunger

e Know that erotic sensations can be stimulated by actions of the baby feeding which can cause feelings of guilt and/or a projection of the inadequacy of breast feeding to satisfy the baby's needs

i. Inform the mother that she may experience an erotic sensation that it is a common occurrence and a normal process

ii Attempt to help the mother discuss her feelings if she suddenly decides to stop breast feeding before lactation is well established

4 Supervise the commencement of breast feeding

a. Know that the infant's demand for nourishment during the first two - three days of life is irregular and his basic need is to suck

b Know that when lactation is established the milk supply is regulated by the infant's demands

c Know that during the first two - three days of breast feeding

i. the sucking stimulus is continued and associated with milk flow

ii the initial mild sucking prepares the nipples for more vigorous nursing

iii the mother and baby become acquainted with one another

iv Establish an atmosphere where success in breast feeding is not associated with the first feeding contact

v Assure the mother that the quantity of milk is not completely established until the second or third week following delivery

d Know that colostrum is secreted by the breasts for the first two - three days following delivery and it has a laxative effect and helps the infant to expel meconium

i Explain to the mother that colostrum is not "weak" milk
ii Persuade the mother not to abandon breast feeding, before the secretion of milk commences, on the basis of the unsatisfactory of the colostrum

e Know that to achieve successful breast feeding both the mother and baby should be ready at the same time

f Know that a mother who has had a long labor and has been heavily sedated will need a rest until the effects of exhaustion and/or sedation are dissipated before being ready to commence breast feeding

g Know that sucking stimulates the infant's gag reflex and will diminish an interest in sucking and feeding

- If the mother is rested and relaxed and the infant has minimal quantities of mucous and is awake and crying commence the feeding regime

5 Prepare for the maintenance of breast feeding over time

a Know that emotional contentment (e.g., receiving household responsibilities) may diminish the milk flow temporarily

b Know that 10 days to 2 weeks after delivery the estrogen level in the blood rises which may inhibit the prolactin hormone secretion

c Know that the stimulation of the baby sucking will, in one or two days, counteract the inhibitory effect of the estrogen

i. Instruct the mother to allow the baby to completely empty the breasts

ii. Assure the mother that the diminished milk supply is temporary (1 - 2 days) and there is no need for her to stop breast feeding

iii. If the baby feeds well for 15-20 minutes and appears satisfied after feeding and sleeps for about 2 hours between feedings

- do not be concerned about daily weight checks

d Know that although lactation may delay ovulation it is possible for ovulation and menstruation to occur during lactation

i. If a mother menstruates while breast feeding there will be no ill effects on either her or the baby

ii. Warn a mother who is breast feeding that she should not rely on lactation as the only method of contraception

6 Supervise the establishment of artificial feeding

A Know that overfeeding can cause

i. diarrhoea
ii functional vomiting

(a) Calculate the appropriate quantity of milk required according to the infant's weight

(b) Allow the infant to take the amount he requires and do not force him to empty a bottle at every feeding

b Know that an artificially fed infant tends to need no quantities of air

c Know that to eructate air bubbles the baby should be held upright or at a 45° angle

i Discourage the mother from feeding the infant rapidly, bringing the baby's head vigorously, and bouncing the baby up and down after feeding, as vomiting could be precipitated

ii. Diminish the quantity of air swallowed by

(a) always having the bottle nipple filled with milk
(b) having the nipple hole size adequate enough for two drops of milk to fall per second

B Six weeks following delivery

1 Repeat the complete examination which was performed at the initial visit

a Know that the pelvic organs should have returned to their pre-pregnant size

b Know that lactation should be well established if breast feeding and the breast should be soft

2 Repeat the complete examination performed on the newborn immediately following delivery

3 Refer to a physician without one week every patient who has a symptom which deviates from the normal

C PATIENT TEACHING

1 Family planning

a Know that contraception methods should be decided by the husband and wife with the professional attendant providing information

b Know that if the husband and wife make the decision together there is a greater probability of the method continuing to be used

- If the couple has used a contraceptive method prior to this pregnancy with which they were satisfied discuss the possibility of continuing with the method

c Know that the choice of methods of contraception are

i. contraceptive hormonal pills
ii. contraception diaphragm or cap
iii. intra-uterine contraceptive devices
iv. sheath or condom
v. spermicidal foams and jellies

d Know that "the pill" can be

i a combination pill (estrogen + progesterone)
ii or a sequential series (estrogen followed by progesterone)

e Know that the administration of estrogens

i. increase the coagulability of the blood
ii. and can be associated with "break through" bleeding

(a) If a mother is known to have

(i) varicose veins
(ii) or a history of phlebitis advise her that she could incur the risk of thrombosis in she took "the pill"

(b) Teach that if "break through" bleeding should occur report to a physician for alteration of the dosage of estrogen

f Know that "the pill" must be taken regularly according to the schedule prescribed

i. Instruct the woman that "the pill" must not be forgotten or taken occasionally

ii Teach the woman to follow the instructions which accompany the prescription

g Know that a diaphragm is a rubber device which is placed in the vagina and covers the cervical os to prevent the entry of sperm and must initially be fitted by a physician

i Instruct the woman that the rubber must be cared for (washed and powdered) so it will permit allowing passage of the sperm

ii The fitting of the diaphragm should be checked annually as the size may need to be changed

iii If the diaphragm is ill-fitting it could become dislodged during coitus

h Know that an intra-uterine device is a plastic device inserted into the uterus

i Know that to eliminate the possibility of damaging a developing embryo an intra-uterine device is inserted during or immediately after menstruation

j Know that an intra-uterine device

i. may be expelled
ii. has a 90% chance of preventing pregnancy

k Know that the sheath provides a mechanical barrier covering the penis, in which sperm are deposited

l Know that coitus interruptus is the removal of the penis from the vagina and the area of the external genitalia prior to ejaculation

m Know and teach that if sperm are deposited on the external genitalia, the moist environs provide an environment in which the sperm could survive, migrate to the vagina and effect fertilization

n Know that spermicidal foams or jellies can be inserted into the vagina to block the cervical and sometimes or kill sperm or can be used in conjunction with the diaphragm method

o Know that the rhythm method is based upon abstinence from intercourse during the woman's period of ovulation

p Know that a basal body temperature rise is an approximate indicator of ovulation and the theoretical fertile period is eight days

q If the questions noted indicate a need for more extensive counselling refer the couple (after discussion) to the appropriate agency

2 Teach the parents to give physical care to the newborn

a. Know that the primigravida may have limited experience with small babies

b Know that the immediate post-partum period may be the only time the multiparous woman may be able to give exclusively to the newborn

i. Encourage the extensive contact between mother and baby

ii. Answer questions which the mothers have concerning the peculiarities of their own babies

iii. Supervise the mother as she begins to give care to the baby (e.g., changing diapers, bathing)

iv. Emphasize the safety aspects of child care

(a) closing safety pins and placing diapers away from the baby

(b) never leaving a baby unattended on an elevated surface without guard rails

(c) not placing hot water near a baby, or in a container with which he could come in contact

(d) holding a baby securely with both hands when lifting and carrying

v. Encourage the mother to express her love for the baby by the way in which she holds him, plays with him, and talks to him

c Know that a mother can be fearful of the appearance of the umbilical cord

d Know that a clean dry umbilical cord will drop off in seven to ten days following delivery

i Encourage to a parent a method of pinning the diaper which leaves the cord stump exposed

ii. Show the mother that the cord can be touched so that the stump may be cleaned and dried

iii Assure the mother that the stump will not bleed when the cord falls off nor will it cause the infant any pain

iv Check the cord with the mother during bathing and observe the umbilicus for signs of reddening and/or purulent discharge

- if noted explain to the mother that this may be a sign of infection and report the findings to a physician immediately

APPENDIX B

VALIDATION QUESTIONNAIRE

VALIDATION QUESTIONNAIRE

		YES	NO
1.	Do you have a midwifery certificate?	☐	☐
2.	Is your field of activity closely associated with maternity care?	☐	☐

This questionnaire is related to what you think of the computer simulation program as a measure of necessary tasks of midwifery practice.

For each of the 6 statements in this questionnaire please indicate whether you agree (A) or disagree (D) with the statement in terms of the computer simulation program.

e.g. Statement 4 reads: Most topice covered were irrelevent to midwifery practice. A ☐ D ☒

This response would indicate that you disagree with the statement.

		A	D
1.	The examination measured the attainment of the objectives of midwifery practice.	☐	☐
2.	The examination gave one the opportunity to deminstrate abilities in some important areas of midwifery practice.	☐	☐
3.	The examination was too difficult.	☐	☐
4.	Most topics covered were irrelevant to midwifery practice.	☐	☐
5.	Only necessary abilities for midwifery practice were measured.	☐	☐
6.	One had to contend with topics beyond one's capabilities.	☐	☐